JAGUAR

Technical Guide

The XJ range
Introduction

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH II
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH
THE QUEEN MOTHER
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY

BY APPOINTMENT TO
HIS ROYAL HIGHNESS THE PRINCE OF WALES
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY

Technical Guide

The XJ range Introduction 2004 / 2005 Model Year

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Preface

The Jaguar Technical Guide is intended to provide an overview only and must not be used as a reference source for servicing procedures. All servicing must be carried out in accordance with the appropriate JTIS disc.

While every effort is made to ensure accuracy, design changes to the vehicle may be made in the period between the completion of this publication and the introduction of vehicles. Details of changes can be obtained from Service Bulletins and revisions to the JTIS disc.

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Glossary

The following abbreviations and acronyms are used in this publication:

Abbreviation / Acronym	Description
ABS	anti-lock braking system
ac	alternating current
ALR	automatic locking retractor
AM	amplitude modulation
ASM	air suspension module
BTS	belt tension sensor
CAN	controller area network
CATS	computer active technology suspension
CCM	climate control module
CD	compact disc
CKP sensor	crankshaft position sensor
cm	centimeter
D2B	digital data bus
dc	direct current
DDM	driver door module
DSC	dynamic stability control
DSM	driver seat module
DTC	diagnostic trouble code
DVD	digital versatile disc
ECM	engine control module
EGR	exhaust gas recirculation
ELMS	electrical load management system
EVAP canister	evaporative emission canister
FCCS	front climate control system
FEM	front electronic module
FM	frequency modulation
FP module	fuel pump module
GPS	global positioning system
HID	high-intensity discharge
HO2 sensor 1	heated oxygen sensor 1
HO2 sensor 2	Heated oxygen sensor 2
HSW	heated steering wheel
IAT sensor	intake air temperature sensor
IC	instrument cluster
IMT valves	intake manifold tuning valves
in	inch
ISO	International Standards Organization
JTIS	Jaguar technical information system
kbps	kilobits per second
km/h	kilometers per hour
kV	kilovolt
LCD	liquid crystal display
LED	light emitting diode
LH	left-hand
LHD	left-hand drive
MAF sensor	mass airflow sensor
MAP sensor	manifold absolute pressure sensor

MHz	megahertz
MIL	malfunction indicator lamp
mile/h	miles per hour
mm	millimeter
ms	millisecond
MY	model year
N	newton
NAS	North American specification
NCM	navigation control module
NOx	oxides of nitrogen
NVH	noise, vibration and harshness
OBD	on-board diagnostics
ORVR	on-board refueling vapor recovery
PATS	passive anti-theft system
PBA	panic brake assist
PCV	positive crankcase ventilation
PWM	pulse-width modulated
RCCP	rear climate control panel
RCCS	rear climate control system
RCM	restraints control module
REM	rear electronic module
RF	radio frequency
RH	right-hand
RHD	right-hand drive
RKE	remote keyless entry
RMM	rear memory module
SCLM	steering column lock module
SCP	standard corporate protocol
SRS	supplementary restraints system
SSP	switched system power
TCM	transmission control module
TG	technical guide
TP sensor	throttle position sensor
Tset	temperature set
VAM	voice activation module
VAPS	variable assisted power steering
VEMS	vehicle emergency messaging system
VICS	vehicle information communications system
VIN	vehicle identification number
VVT	variable valve timing
W	watt
WDS	worldwide diagnostic system

Introduction

The new XJ, Jaguar's flagship luxury sedan, takes full advantage of the many new systems and technological developments now available.

- The monocoque body, manufactured almost entirely from aluminum, is approximately 40% lighter than an equivalent steel body and contributes significantly towards improved fuel economy and vehicle performance.
- The instrument panel assembly is built around a magnesium cross-car beam. The glove compartment includes a shelf and an accessory power socket; the door is electrically secured and features one-touch release. In addition to the standard floor-console, a dedicated four-zone version accommodates the rear climate control system.
- All seats are constructed using magnesium frames and incorporate electrically adjustable lumbar supports and head restraints. The front seats incorporate anti-whiplash mechanisms and the now familiar occupant safety features.
- Side-curtain air bags, occupancy sensing and rear safety-belt pre-tensioners are standard installations.

Powertrain features:

- The AJ-V8 4.2-liter, an upgrade and replacement of the previous 4.0-liter engine, is available in both normally aspirated and supercharged variants.
- The AJ-V8 3.5-liter, an upgrade and replacement of the previous 3.2-liter engine, is available as normally aspirated only. The 3.5-liter engine makes its Jaguar debut in the XJ.
- The AJ-V6 3.0 liter completes the line-up.
- All four engines are coupled to the 6-speed automatic transmission, which when compared to the previous 5-speed automatic transmission, provides: higher torque capacity; reduced length and weight; improved fuel consumption and vehicle performance.
- The cooling pack assembly includes: the integration of the receiver-drier into the condenser and the cooling fan directly driven by a brushless motor.
- The exhaust system is constructed of stainless steel with polished, detachable tail-pipe sleeves.
- The fuel system is an electronic returnless fuel type and features a saddle tank positioned underneath the vehicle. A single fuel-pump located inside the tank on normally aspirated vehicles, provides optimum fuel-delivery performance. A twin-pump fuel delivery system meets the flow-rate requirement of supercharged vehicles.

Chassis features:

- A significant development is the microprocessor based chassis control system, comprising an advanced air suspension system and enhanced adaptive damping. Specially designed to accommodate the lightweight aluminum-body of the XJ, the system provides optimum driving stability and comfort.
- The front and rear suspension are both double-wishbone arrangements assembled on isolated subframes. Extensive use of aluminum provides both a lighter and more responsive suspension.
- An enhanced steering system, which when combined with changes made to the suspension system provides excellent steering response and feel.
- The upper steering column features a unique crash-load absorption system and the lower column incorporates a new crash-collapse mechanism.
- Dynamic Stability Control (DSC) features all-new hardware and is fitted as standard.
- Panic brake assist, responds to the driver's reactions in an emergency-braking situation by providing an increased braking force to activate the ABS.
- The adjustable pedals have been designed to complement the adjustable steering column in providing some drivers with a range of improved driving positions.
- An electric parking brake is fitted as standard. In addition to saving space within the passenger compartment, the parking brake is easier to use and automatically actuated when the ignition key is removed.

Introduction

Electrical features:

- An intelligent electrical load management system has been introduced. The system uses a subtle, electrical monitoring and control strategy, designed to accommodate an increase in major electrical features, by limiting the detrimental effect on the battery and ultimately the vehicle.
- A two-zone automatic climate control system is installed as standard. The system includes an air-intake filter, a single blower, a receiver-drier that is integral to the condenser and a clutchless compressor. The four-zone system (where installed) provides rear-seated passengers with the option to control the climate for their individual zones independently from the front two zones.
- The rear multimedia system provides rear seat occupants with the opportunity to select from a choice of different entertainment sources, independent of each other and to that selected by the front passenger.
- In conjunction with the rear multimedia system, multizone voice (where installed) facilitates the voice control of most functions available to the front seat passengers and also provides the option to engage in telephone conference calls.
- Xenon headlamps provide improved visibility and reliability. To comply with legislation, signals from the air suspension system are utilized for automatic headlamp adjustment. Tail and stop lighting features LED technology for improved reliability and responsiveness.
- The telematics system with optional multi-functional touch-screen, allows control of audio, climate, phone, navigation and TV. DVD technology is used for the navigation system.

Dimensions

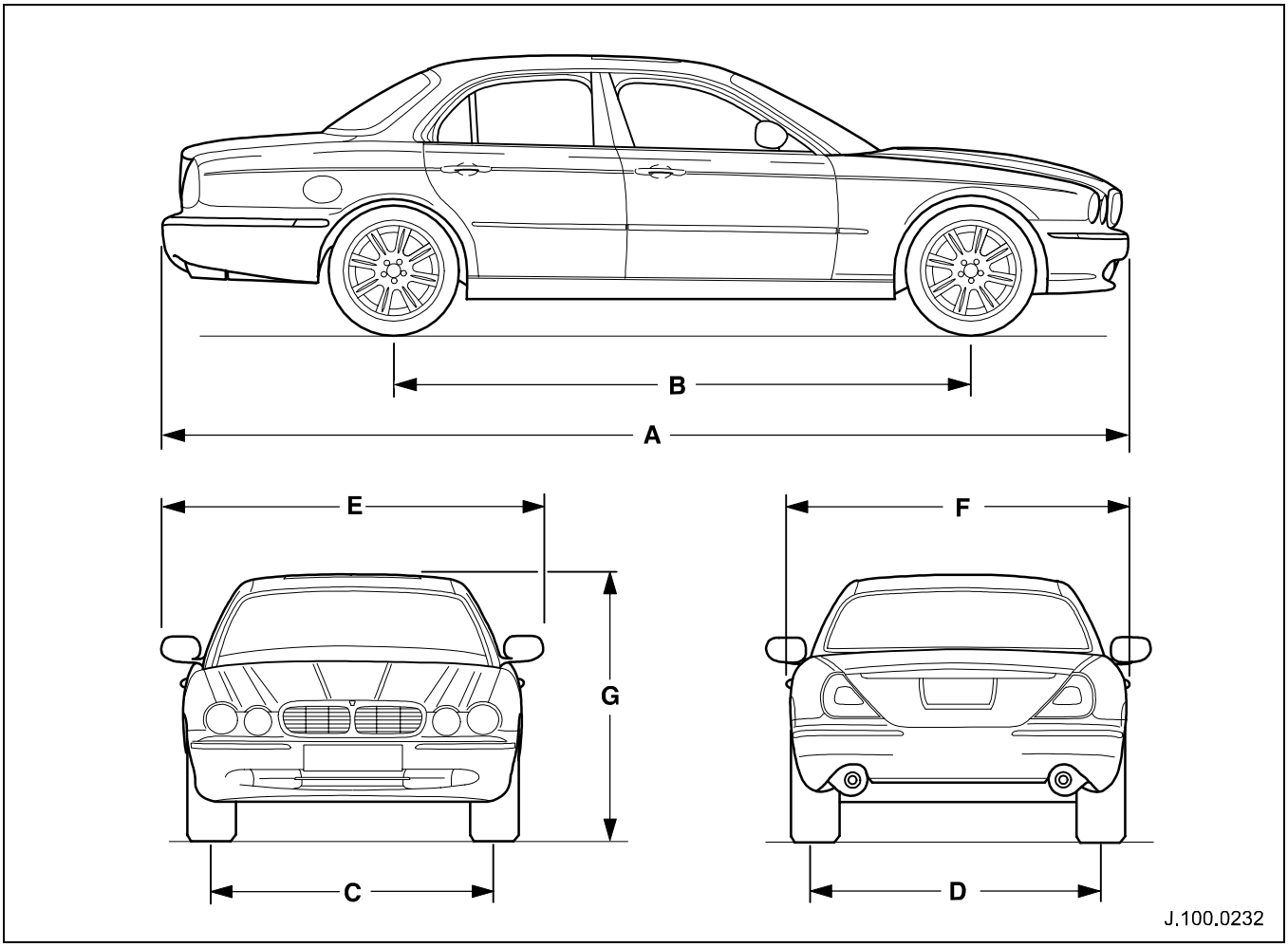


Fig. 1 External dimensions

Dimension	inches	millimeters
A	200.4	5090
B	119.5	3034
C	61.3	1556
D	60.9	1546
E	83	2108
F	73.3	1860
G	55	1448

Table 1 External dimensions (refer to Fig. 1)

Measurement **G** is the vehicle standard ride-height; refer to **Air Suspension**.

Jacking and Lifting

CAUTION:

- **Jacking and lifting points are critical.**
- **Vehicle support stands should only be used in conjunction with cushioned pads.**

Refer to JTIS for detailed information.

Vehicle Recovery and Towing

CAUTION: It is critical that the correct recovery method is always employed; refer to JTIS for detailed information.

Repair Technology

Body And Paint Repairs

Repairs to aluminum requires different tools and techniques to those used for steel. Repairs should only be undertaken by trained Body and Paint Repair technicians; refer to **New XJ Range Body and Paint Repair Supplement** for detailed information.

General Repairs

- Avoid using components that could damage the paint system, such as, self-tapping screws, spring-steel clip or paint-clearing screws.
- To ensure anti-corrosion integrity is maintained, use only genuine Jaguar fasteners; refer to **JTIS**.
- Always reinstate the paintwork to its condition prior to commencing the repair; refer to **New XJ Range Body and Paint Repair Supplement** for detailed information.

The new XJ has been carefully designed to take into account the benefits of using aluminum but also to prevent the electrolytic interaction of dissimilar metals; refer to **Body Construction**.

Accessories

Only Jaguar approved accessories should be installed.

CAUTION: Always install accessories in accordance with the fitting instructions supplied and using the recommended fasteners.

Suspension

Introduction

A completely redesigned suspension system, provides the following enhancements:

- improved noise, vibration and harshness (NVH) suppression,
- enhanced damping performance,
- improved roll-control,
- revised suspension geometry,
- strengthened structure,
- improved vehicle crash performance.

An extensive use of aluminum is used in the manufacture of the suspension components to provide a lighter and more responsive suspension.

A further and significant development is the microprocessor based chassis control system, comprising an advanced air suspension system and enhanced adaptive damping. The system consists of a number of components interconnected by pneumatic lines and an air suspension module (ASM). The system provides optimum driving stability and comfort, and is specially designed to accommodate the lightweight aluminum-body of the XJ. Refer to the **Air Suspension** and **Adaptive Damping** sections.

CAUTION: Do not use jacking equipment on suspension components, use identified jacking points only; refer to 'JTIS'.

Front Suspension

The front suspension is assembled on an isolated subframe, mounted via four bolts to the vehicle body. Hydrabushes incorporated in the rear mountings of the subframe provide added suspension refinement; the front mounting bushes are conventional rubber types. Spacer bars located between the subframe and vehicle body provide support for the vehicle's cooling pack and cross-brace. The cross-brace improves NVH characteristics by increasing body stiffness.

The front suspension arrangement is a double-wishbone type, with the length ratio between the two control arms calculated to optimize track and camber control. In addition, the upper control-arm is designed to improve castor trail and subsequently steering-feel. Inclination of the upper control-arm axis provides an anti-dive and anti-squat action during vehicle braking and acceleration. The lower control arm is a split design, which de-couples to allow for improved bush adaptation. A hydrabush fitted to the forward lower-control arm where it attaches to the subframe provides vibration damping. The swan-neck wheel knuckle is supplied in two derivatives to accommodate the different caliper mounting points of normally aspirated and supercharged vehicles.

NOTE: The subframe must be correctly aligned to the vehicle's body to ensure the correct operating angle of the drive shaft; refer to JTIS for the installation procedure.

Front Spring and Damper Assembly

Refer to **Air Suspension** and **Adaptive Damping** sections.

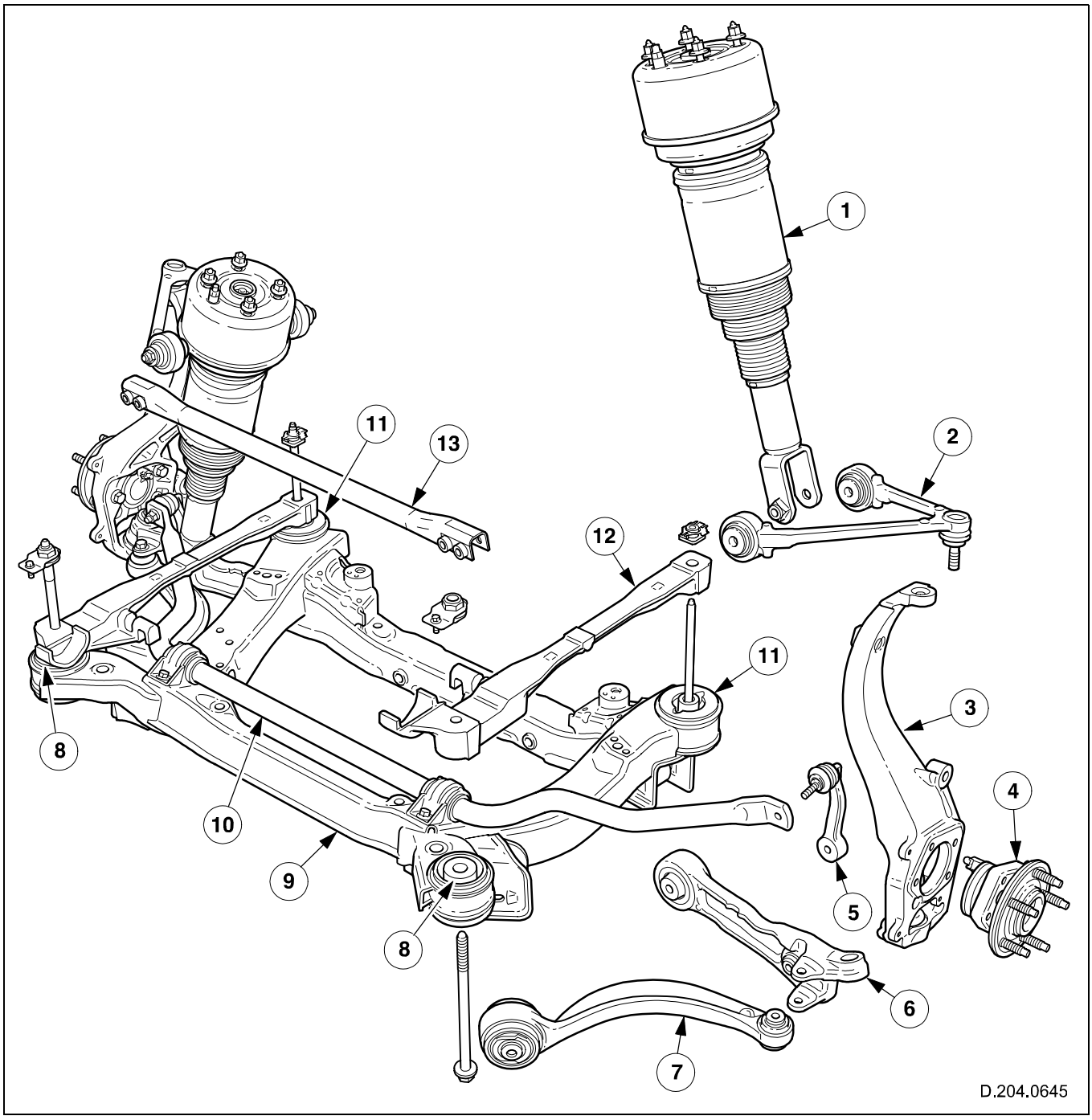


Fig. 2 Front suspension components

Key to Fig. 2

1. Air spring and damper assembly
2. Upper control arm
3. Swan neck wheel knuckle
4. Wheel hub and bearing assembly
5. Stabilizer-bar drop link
6. Lower control arm - lateral
7. Lower control arm - forward
8. Conventional mounting bush
9. Subframe
10. Stabilizer bar
11. Hydrabush mounting
12. Spacer rail
13. Cross brace

Rear Suspension

The rear suspension is assembled on an isolated subframe, mounted via four bolts to the vehicle body. Two hydrabushes incorporated in the forward mountings and two void-type bushes in the rear mountings provide optimum suspension refinement. The double-shear bracket brace improves NVH characteristics by providing additional mounting stiffness.

As with the front suspension the rear suspension is also a double-wishbone type. Inclination of the upper control-arm axis provides an anti-dive and anti-squat action during vehicle braking and acceleration. The wheel knuckle is supplied in two derivatives to accommodate the different caliper mounting points of normally aspirated and supercharged vehicles.

NOTE: The subframe must be correctly aligned to the vehicle's body to ensure the correct operating angle of the drive shaft; refer to 'JTIS' for the installation procedure.

Rear Spring and Damper Assembly

Refer to **Air Suspension** and **Adaptive Damping** sections

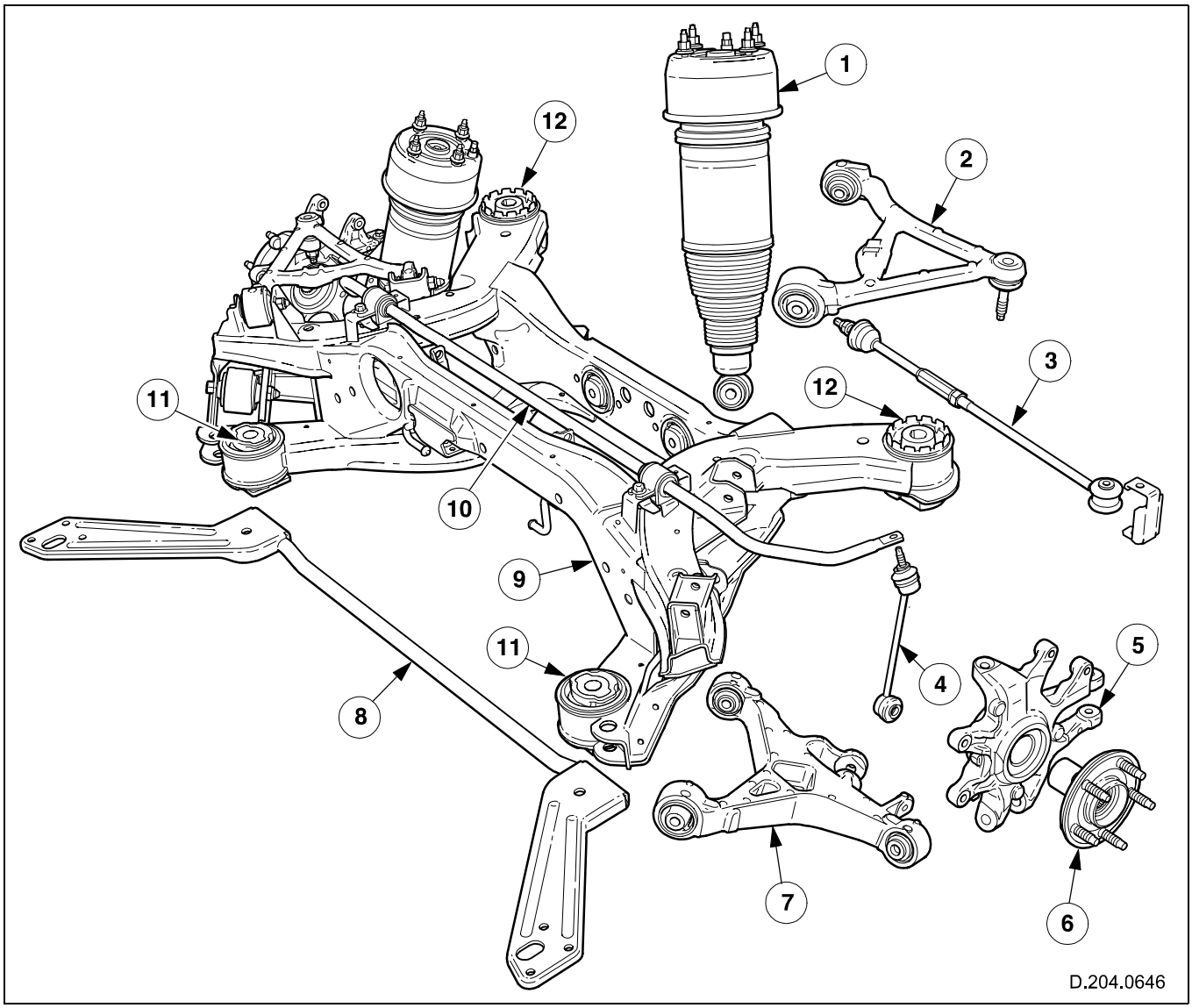


Fig. 3 Rear Suspension Components

1. Air spring and damper assembly
2. Upper control arm
3. Toe control link
4. Stabilizer-bar drop link
5. Wheel knuckle
6. Wheel hub and bearing assembly
7. Lower control arm
8. Double-shear brackets and brace
9. Subframe
10. Stabilizer bar
11. Hydrabush
12. Voided rubber bush

Air Suspension

With the introduction of the lightweight aluminum body, the payload of the new XJ is now a higher percentage of the vehicle's total weight. To accommodate this reduction in body-weight a vehicle with a conventional coil-spring suspension would need either:

- an increase in unladen height, or
- a higher spring-rate.

Both of which would mean a compromise between driving dynamics, ride comfort and the vehicle's stance appearance. To overcome these compromises and maintain a constant vehicle height independent of load changes, the XJ features a newly developed four-corner air suspension system in place of the coil-spring suspension.

Air suspension ensures maximum spring travel is always available providing excellent ride comfort and optimum driving safety. Another benefit of the system is the ability to lower the vehicle at a configured road speed to improve aerodynamic efficiency and further improve vehicle stability and fuel efficiency. The air suspension system is fully automatic, requiring no driver intervention.

The air suspension is available in either standard ride or sport ride derivatives depending on vehicle specification.

System Overview

The air suspension is a microprocessor based chassis-control system, comprising a number of components interconnected by pneumatic lines and the air suspension module (ASM). The vehicle weight is supported by compressed air enclosed in the rubber bellows of the air springs. Suspension height and level control are obtained by supplying or releasing compressed air with instantaneous response from the air springs. This process is actuated individually at each wheel by means of fast acting solenoid valves.

The necessary values for controlling the valves are supplied to the ASM by the height sensors located inboard of each wheel. The height sensors measure the distance between the suspension and the vehicle's body. Various other vehicle status values processed by the ASM are supplied via the controller area network (CAN). The ASM uses these values to provide the optimum suspension condition for existing road and driving conditions.

Driver Information

There are two messages that may be displayed on the vehicle message center associated to the air suspension system; refer to table below:

Message	Warning Light	Priority Indicator	Meaning
AIR SUSPENSION FAULT	None	None	Drive the vehicle with caution and inform your nearest Jaguar Dealer to have the fault rectified.
VEHICLE TOO LOW	None	None	The air suspension system is too low. Start the engine and wait for the message to clear before driving the vehicle. If the message is displayed while you are driving, restrict your speed until the message is cleared. If the message is persistently shown, inform your Jaguar Dealer.

Components

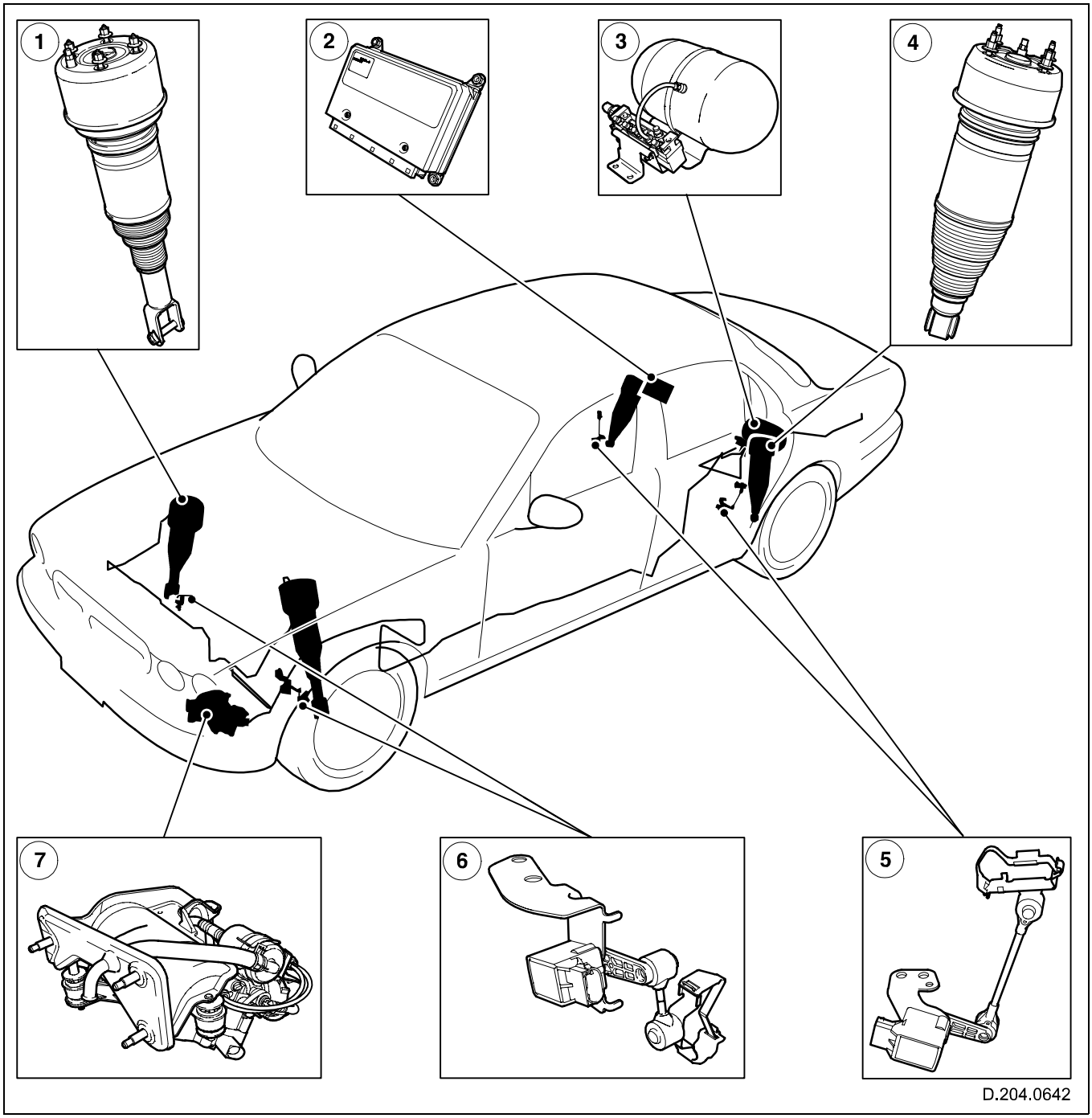


Fig. 4 Air suspension components

1. Front air spring and damper assembly
2. Air suspension module
3. Air reservoir and valve block
4. Rear air spring and damper assembly
5. Rear height sensor
6. Front height sensor
7. Air compressor

WARNING: The air suspension system must be depressurized using WDS before commencing any repair operations on the air suspension system; refer to 'JTIS' for further information.

Air Suspension Module

The air suspension module (ASM), which also controls the adaptive damping system and provides height sensor information for the automatic headlight leveling, is located behind the rear seat. The ASM provides a number of air suspension operational modes dependent on the vehicle state; refer to **Operating Modes and Strategies**.

ASM hardwired inputs:

- Height sensors
- Valve block pressure sensor
- Vertical accelerometers (adaptive damping only)
- Valve block solenoid control

ASM inputs, via the CAN:

- Vehicle speed
- Engine speed
- Engine torque
- Lateral acceleration
- Steering wheel angle
- Steering wheel velocity
- Brake line pressure
- Ambient temperature

The ASM will require calibrating using WDS if:

- the ASM is replaced;
- a height sensor is removed and reinstalled;
- a height sensor is replaced.

Refer to 'JTIS' for further information.

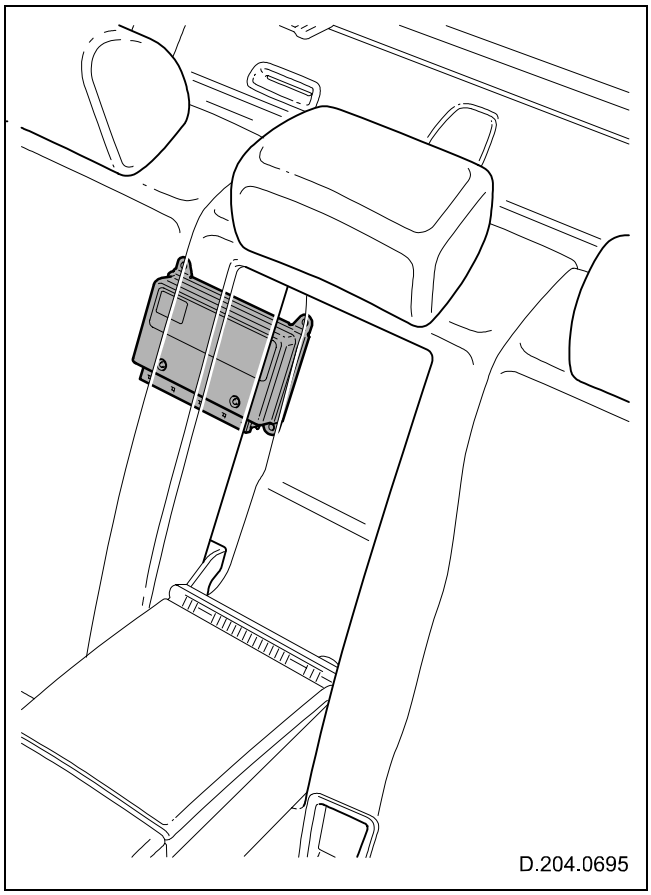


Fig. 5 Air suspension module

Air Compressor

The air compressor is mounted on the left-hand side of the vehicle behind the front bumper beam. To maintain a quiet operation the compressor is isolated from the vehicle's body by three mounting rubbers. The compressor performs the following functions:

- Air compression: Air is drawn into the compressor through a snorkel located inside the vehicle's front bumper, via a filter, and compressed by a motor-driven, single-cylinder reciprocating piston.
- Air drying: An integral air-drier maintains a low-moisture environment inside the suspension's pneumatic system. Desiccant in the drier removes moisture from high-pressure air as it is pumped into the suspension system. Air vented from the suspension system flows over the desiccant at low pressure, removing moisture from the desiccant and returning it to atmosphere. This regenerates the desiccant so it can remove moisture during subsequent compression cycles.
- Operating pressure: Nominal operating pressure is 15 bar, a pressure-retaining valve maintains a minimum pressure of 3 bar in the system to protect the air springs.
- Pressure relief: A pressure relief valve set at 17.5 bar diverts high-pressure air to atmosphere when the nominal operating threshold is exceeded. This protects the air springs and other system components in the event of a system malfunction.
- Thermal protection: Compressor run time is limited to two minutes. If the operating temperature exceeds a defined limit within this time the compressor will shutdown. The compressor will resume operation when it cools to its normal operating temperature (usually within 30 to 40 seconds).
- Air release: Air exhausted from the suspension system exits through the snorkel located inside the vehicle's front bumper.

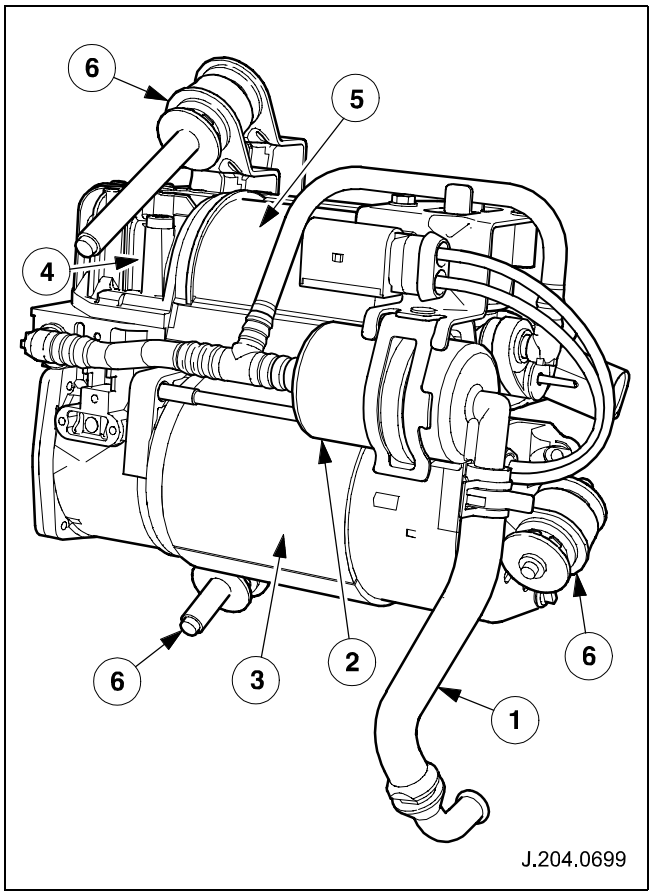


Fig. 6 Air compressor

1. Air intake/outlet snorkel
2. Filter
3. Motor
4. Piston cylinder-head
5. Air drier
6. Mountings

Reservoir and Valve Block

The reservoir and valve block, are installed underneath the spare wheel and protected by a cover; the cover also acts to suppress noise emitted from the solenoid valves.

Reservoir:

- Reservoir volume is 4.5 liters with a maximum pressure of 15 bar, as controlled by the ASM.
- The compressor operates for approximately two minutes to complete a full recharge of the reservoir.
- With the reservoir at maximum pressure, the reservoir is capable of one complete lift of the vehicle.
- The air suspension operates within a defined pressure range; under normal operating conditions the reservoir does not deplete below the pressure of 9 bar. This prevents the air pressure held within the air springs transferring to the reservoir.

Valve Block:

- The valve block is mounted onto the reservoir bracket via isolators to reduce noise being transmitted to the vehicle body when the solenoid valves switch.
- The solenoid valves as commanded by the ASM perform the air distribution within the air suspension system.
- There are five solenoid valves installed in the valve block one for each of the four springs and one for the reservoir.
- The valve block contains a pressure sensor to monitor the pressure within the air springs and reservoir. The data supplied by the pressure sensor is one of the inputs used by the ASM to determine whether to raise the vehicle using the compressor or the reservoir reserves.

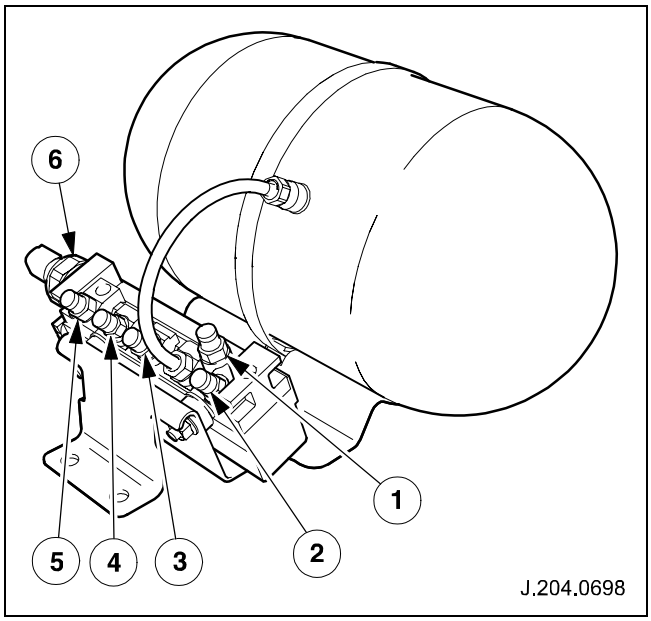


Fig. 7 Reservoir and valve block

1. Air compressor port
2. Air spring port - left-hand-rear
3. Air spring port - right-hand-front
4. Air spring port - right-hand-rear
5. Air spring port - left-hand-front
6. Pressure sensor

Air Springs and Dampers

WARNING: The air suspension system must be depressurized using WDS before commencing any repair operations on the air suspension system; refer to 'JTIS' for further information.

CAUTION: Care must be taken not to damage the air springs during repair operations; refer to 'JTIS' for care points.

- The air springs are integrated into the suspension in a manner similar to conventional coil springs and are actuated by either the air compressor or reservoir to control vehicle ride height and leveling.
- The front air springs are controlled as a pair, whereas the rear air springs are controlled independently. This is to provide level correction for uneven distribution of loads, which is usually more severe in the rear of a vehicle. Load distribution usually remains constant in the front of a vehicle.
- An outer support sleeve assembled over the damper, guides the air spring. An integral pressure retaining-valve ensures that the air pressure never drops below 3 bar within the spring. This pressure maintains the spring's internal components in their correct orientation and prevents the bellow's membrane from creasing.
- Normal operating pressure of the air spring is approximately between 7 and 9 bar, with a maximum 'full bump' pressure of approximately 20 bar.
- There are two derivatives of air spring dependant on vehicle specification:
  - Comfort: high air volume = softer ride.
  - Sport: low air volume = stiffer ride.
- The air springs are complemented by adaptive damping actuation; refer to the **Adaptive Damping** section.
- Other air spring features which improve ride quality and noise, vibration and harshness (NVH) refinement include:
  - A unique top-mount feature to isolate the damper from the body.
  - An air spring isolator, which reduces generated high frequency inputs, for example when traveling over rough terrain.
- Due to the nature of the sealing arrangement between the air spring and damper, the two parts cannot be separated and must be replaced as a complete unit.

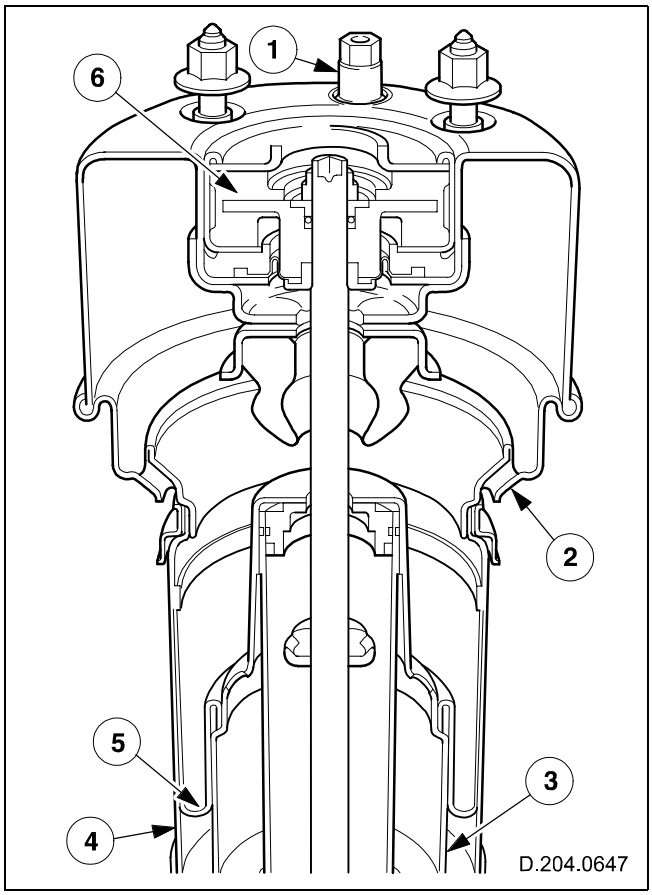


Fig. 8 Air spring internals

1. Retaining valve
2. Isolator
3. Piston
4. Outer sleeve
5. Rolling bellow's membrane
6. Top mount

Height Sensors

- Four Hall effect rotary height sensors measure relative displacement between the body and a suspension component. The motion ratio of the height sensor attachment to the suspension component and the measured height sensor displacement are used to determine vehicle ride height.
  - The front height sensors are mounted to the front subframe and connected to the lower control arm.
  - The rear sensors are mounted to the rear subframe and connected to the upper control arm.
- Each sensor transmits raw unfiltered data to the ASM, where the data is then filtered to respond to either fast or slow vehicle loading/unloading:
  - Fast filter: Sudden weight changes due to passenger and luggage loading/unloading; or the vehicle traveling over rough terrain. The suspension reacts instantaneously to correct the ride height.
  - Slow filter: Gradual weight reduction due to fuel consumption, the suspension counters the weight loss by slowly adjusting the ride height.

Air Harness

- The rear air harness is integrated into the electrical harness; the front air harness is routed underneath the floor and within the engine compartment.
- The front harness has a 6mm diameter; the rear harness has a 4mm diameter. This difference in diameter is to balance the response time in air spring actuation and exhaust, in respect to the distance of the springs from the valve block and reservoir.
- The harness tubes are color coded to ensure correct installation; refer to 'JTIS'.
- The harness is manufactured from Polyamide tube, which has good abrasion resistance properties.

System Operation

This subsection discusses the base operation of the air suspension system and should be read in conjunction with the subsection **Operating Modes and Strategies**.

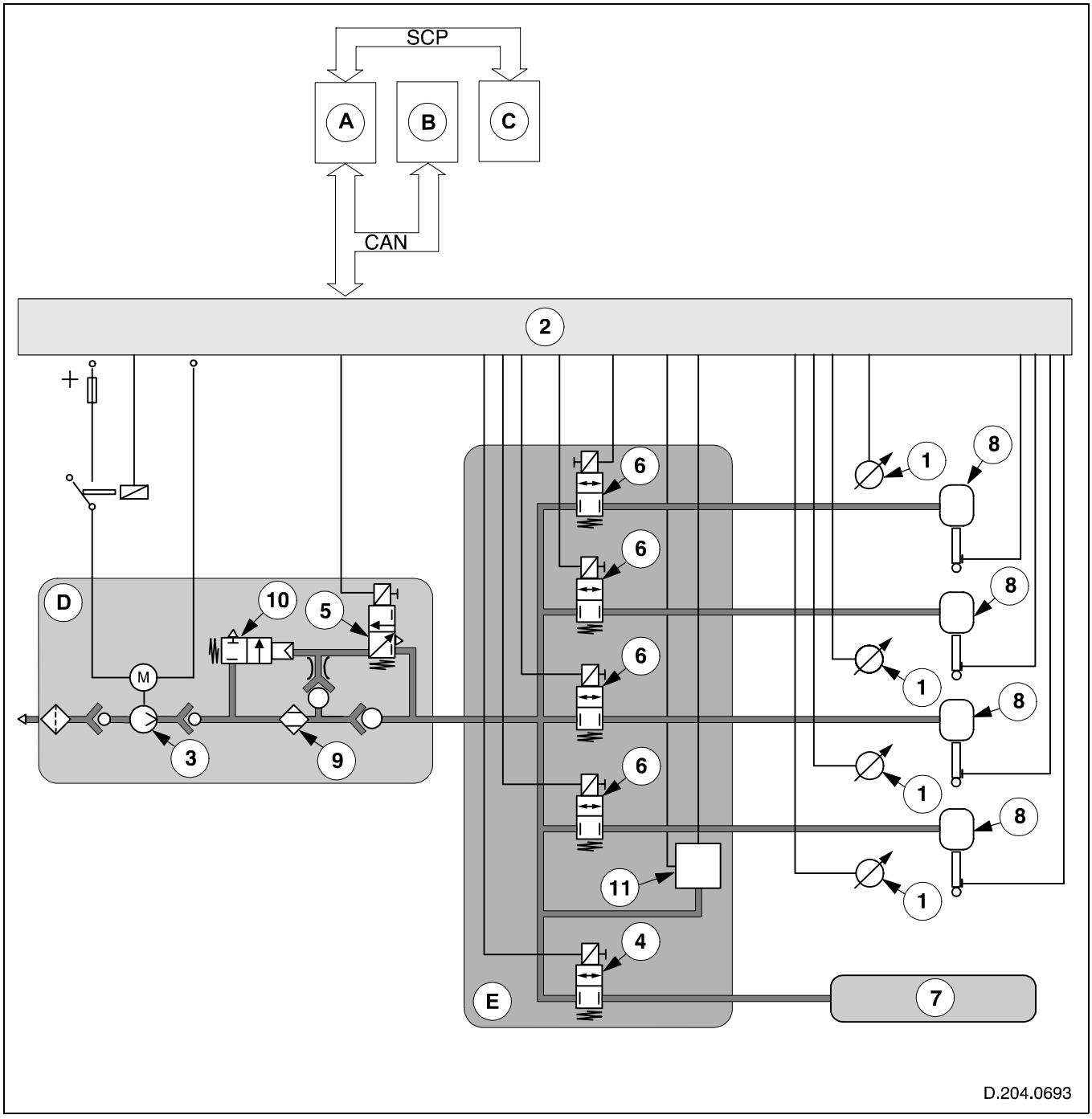


Fig. 9 System diagram

Key to Fig. 9

A. Instrument cluster - provides signals of vehicle system status
B. ABS module - provides vehicle speed signals
C. REM - provides trailer tow, brake switch on/off status and system switch power (SSP) signals
D. Air compressor unit
E. Valve block
1. Height sensors
2. Air suspension module (ASM)
3. Air compressor motor
4. Reservoir solenoid
5. Vent solenoid
6. Air spring solenoid valves
7. Reservoir
8. Air springs
9. Air drier
10. Relay valve
11. Pressure sensor

- The height sensors (**1**) monitor the distance between the vehicle's suspension and body. In response to changes in ride height, the electronic signals from the sensors reflect the height changes. These signals are monitored by the ASM (**2**), and compared to stored reference values. The ASM calculates this information to either raise or lower the vehicle and retain a constant suspension level.
- To raise the vehicle the ASM, depending on vehicle status, activates either:
  - the electric motor of the compressor (**3**), or
  - the reservoir solenoid (**4**).
- To lower the vehicle the ASM activates the vent solenoid (**5**).
- Every process simultaneously causes the air-spring solenoid valves (**6**) to be actuated to allow air to flow, to and from the air springs.
- When the vehicle is being raised:
  - the compressor motor (**3**) via air drier (**9**), or the
  - reservoir (**7**) via the reservoir solenoid (**4**),
  - delivers air into the air-spring bellows (**8**) until required height has been reached.
- When the vehicle is being lowered, the air flows from the air spring bellows (**8**), through the vent solenoid (**5**) of the air drier (**9**), via the relay valve (**10**) and evacuated to atmosphere.
- The pressure sensor (**11**) is incorporated to monitor spring and reservoir pressure. The ASM uses the pressure sensor data plus the data received via the CAN relating to vehicle status, to determine whether to raise the vehicle using the compressor or the reservoir reserves.

Operating Modes and Strategies

The ASM provides a number of air suspension operational modes dependent on the vehicle state:

Transportation Mode

Vehicles arrive at dealers in transportation mode and will need to be switched, using WDS, to customer mode.

- Transportation mode levels the vehicle to 15mm above the standard ride height to avoid ground clearance issues when loading the vehicle on to transporters, ships, etc.
- When the engine is running the compressor only is used to level the vehicle, independent of road speed.
- When in transportation mode the message center will continuously display 'Air Suspension Fault' until the vehicle is switched to customer mode.

WARNING: Once the vehicle has been switched to 'customer mode', body-securing straps/chains must not be used to secure the vehicle to a recovery transporter. Use straps over the wheels/tires only, to secure the vehicle to the transporter.

Leveling Strategy

- Raising has priority over lowering.
- The rear axle will rise before the front axle.
- The front axle will lower before the rear axle.
- To compensate for uneven loading of the vehicle, the rear air springs are regulated individually, this means the comparison of the nominal and actual level is performed for both sides individually.
- As front loading is not as extreme as rear loading, and to allow for a stable adjustment process, the front air springs are regulated and adjusted as a pair.

Customer Mode

The modes diagram below shows the transitions between the different modes within customer mode, these modes are dependant on various ASM input signals and the switched system power (SSP) signal. The SSP signal is functioned by the rear electronic module (REM) and is used to monitor and switch the modes, as necessary, when the ignition key is removed.

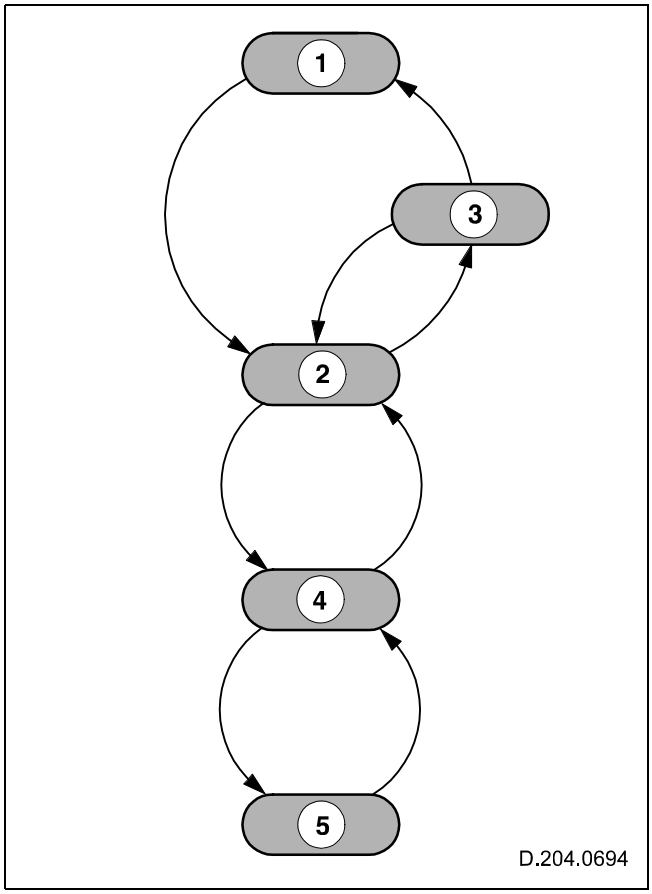


Fig. 10 Customer modes

1. Sleep mode
2. Preliminary mode
3. Post mode
4. Stance mode
5. Drive mode

NOTE: Ambient temperatures affect the vehicle ride height; the suspension lowers as the ambient temperature lowers, and rises as the ambient temperature rises.

1. Sleep Mode
   Sleep mode is invoked approximately thirty minutes after the ignition is switched off and the last door or luggage lid activity has been detected. The air suspension system shuts down when the vehicle is not in use and automatically wakes up every twenty-four hours to check the vehicle ride height. Twenty-four hour multiples are used to avoid temperature variation, for example to avoid the variability between day and night temperatures.
   If the suspension level requires correcting, the suspension's lowest corner will be used as the height value and the suspension will be lowered to meet that height. If the suspension lowers to the minimum height, the ASM makes no further adjustments. To conserve reservoir pressure and battery power the system does not raise the ride height when in sleep mode.
   When the SSP signal detects a door or luggage lid activity the suspension will switch to preliminary mode.
2. Preliminary Mode
   This mode is activated by any of the three following actions:
   - The SSP signal detecting a door or luggage lid activity when in sleep mode.
   - The SSP signal detecting a door or luggage lid activity when in post mode.
   - Switching the engine 'off' in stance mode.

   To avoid excessive leveling actions during vehicle loading/unloading, the ride height tolerances in preliminary mode are greater than those used in stance and drive modes. In preliminary mode the ride-height is raised using the reservoir's supply only. Suspension lowering is also functioned if necessary. The height sensors use a fast filter signal to enable a quick leveling response to load changes; refer to **Height Sensors**.
   The preliminary mode will switch to either of the two following modes depending on signals transmitted to the ASM:
   - If the engine is started the suspension will switch to stance mode.
   - When there has been no loading/unloading or door activity for a predetermined length of time, the SSP instructs the ASM to switch to post mode.

3. Post Mode
   Post mode is activated if SSP detects no loading/unloading or door activity for a predetermined length of time in preliminary mode.
   Post mode will raise the vehicle to the standard ride height if there is enough pressure within the reservoir. Compressor function is inhibited.
   The post mode will switch to either of the two following modes depending on signals transmitted to the ASM:
   – If the SSP signal detects a door or luggage lid activity the suspension will switch to preliminary mode.
   – If a predetermined amount of time elapses with no loading/unloading or door activity, the suspension will switch to sleep mode.
4. Stance Mode
   The ASM switches from preliminary mode to stance mode when the vehicle is stationary and the engine is started.
   The vehicle is leveled to a tighter tolerance to ensure the ride height is correct before vehicle moves off. The ride height is raised using the reservoir's supply, unless the vehicle is below a minimum height and the reservoir's supply is depleted. In this event the compressor is used to raise the vehicle. The height sensors use a fast filter signal to enable a quick leveling response to load changes; refer to **Height Sensors**.
   The stance mode will switch to either of the two following modes depending on signals transmitted to the ASM:
   – If the vehicle accelerates above 1 km/h (0.6 mile/h) the suspension will switch to drive mode.
   – If the engine is switched 'off' the suspension will switch to preliminary mode.
5. Drive Mode
   The ASM switches from stance mode to drive mode when the vehicle accelerates above 1 km/h (0.6 mile/h).
   Above a predetermined road speed, the compressor is used to raise the vehicle ride height. This mode is also used to replenish the reservoir. The height sensor filtering is switched to slow filter at speeds above 1 km/h (0.6 mile/h), although this will change to fast filter when leveling occurs; refer to **Height Sensors**.
   If vehicle speed is lower than 1 km/h (0.6 mile/h), the ASM switches to stance mode.

Additional Modes and Strategies

- Speed Lowering Mode
  The speed-lowering mode is a function of drive mode:
  – When the vehicle maintains a speed of 160 km/h (100 mile/h) or above, and 10 seconds elapse, the suspension lowers 15 mm below the standard ride height.
  – The suspension returns to the standard ride height when the vehicle speed decreases below 140 km/h (88 mile/h) and 5 seconds elapse.
- Towing Mode
  The ASM inhibits the speed lowering function when the vehicle is towing.

  WARNING: The towing mode inhibits speed lowering, when using Jaguar approved towing equipment only.
- Rough Road Detection
  The ASM inhibits the speed lowering function when a rough road surface is detected; the vehicle is raised to the standard ride height to ensure passenger comfort.
- Leveling Inhibits
  The ASM recognizes significant cornering, braking and acceleration actions and inhibits suspension leveling during these periods.
- Jacking Mode
  The ASM detects when the vehicle is being raised using jacking equipment by monitoring height changes at the individual wheels. The ASM will initially attempt to adjust the suspension, but will recognize that the vehicle height is not responding as normal and inhibit suspension leveling.
  A suspension inhibit will also be initiated when the vehicle is suspended on a lift, and all four-wheels are being lowered. In this condition, when the suspension travel exceeds a predetermined value, air exhausting will be inhibited.
  The inhibit function will remain initiated until the vehicle height returns to normal, or a wheel speed signal of 3 km/h (2 mile/h) is detected.
- Inclination Mode
  The ASM activates the inclination mode when the vehicle is parked on an uneven surface for example, with one wheel on a curb. If the ASM detects what is effectively a sufficient twist between the front and rear axles, the axles will be leveled as a pair. This avoids suspension leveling when the vehicle is moving away.
- Diagnostics
  System fault codes are stored in the ASM for diagnosis using worldwide diagnostic system (WDS).

Adaptive Damping

The adaptive damping system also known as computer active technology suspension (CATS) has been enhanced to improve vehicle:

- control when accelerating and braking;
- stability when making lane change maneuvers;
- stability and comfort when cornering.

As with the previous version the dampers, depending on road and vehicle dynamic conditions, are switched between:

- a 'soft' setting for a comfort saloon ride, or
- a 'firm' setting for a stiffer sports ride.

Further enhancements made to the system can now function the damper settings to switch in pairs:

- front or rear,
- left or right (inside or outside when the vehicle is cornering).

Adaptive damping is fully automatic, with no visual indication communicated to the driver when the dampers switch between settings.

System Functionality

The dampers are switched between a 'soft' or 'firm' setting by electronics integrated into the air suspension module (ASM); refer to **Air Suspension**. Various vehicle status values are processed by the ASM; refer to **Fig. 11**. The ASM compares this data with stored data and starts a programmed arithmetic process (algorithm) to calculate the optimum setting to apply to the dampers at a specific vehicle state. For example, when the vehicle is either: braking, accelerating or cornering.

The damper-setting control signals are transmitted to an actuator integrated into each of the dampers. The actuators change the speed of damper piston movement by altering the rate of fluid-flow within the dampers:

- Soft setting - maximizes fluid flow to produce less resistance, therefore a quicker piston movement.
- Firm setting - minimizes fluid flow to produce more resistance, therefore a slower piston movement.

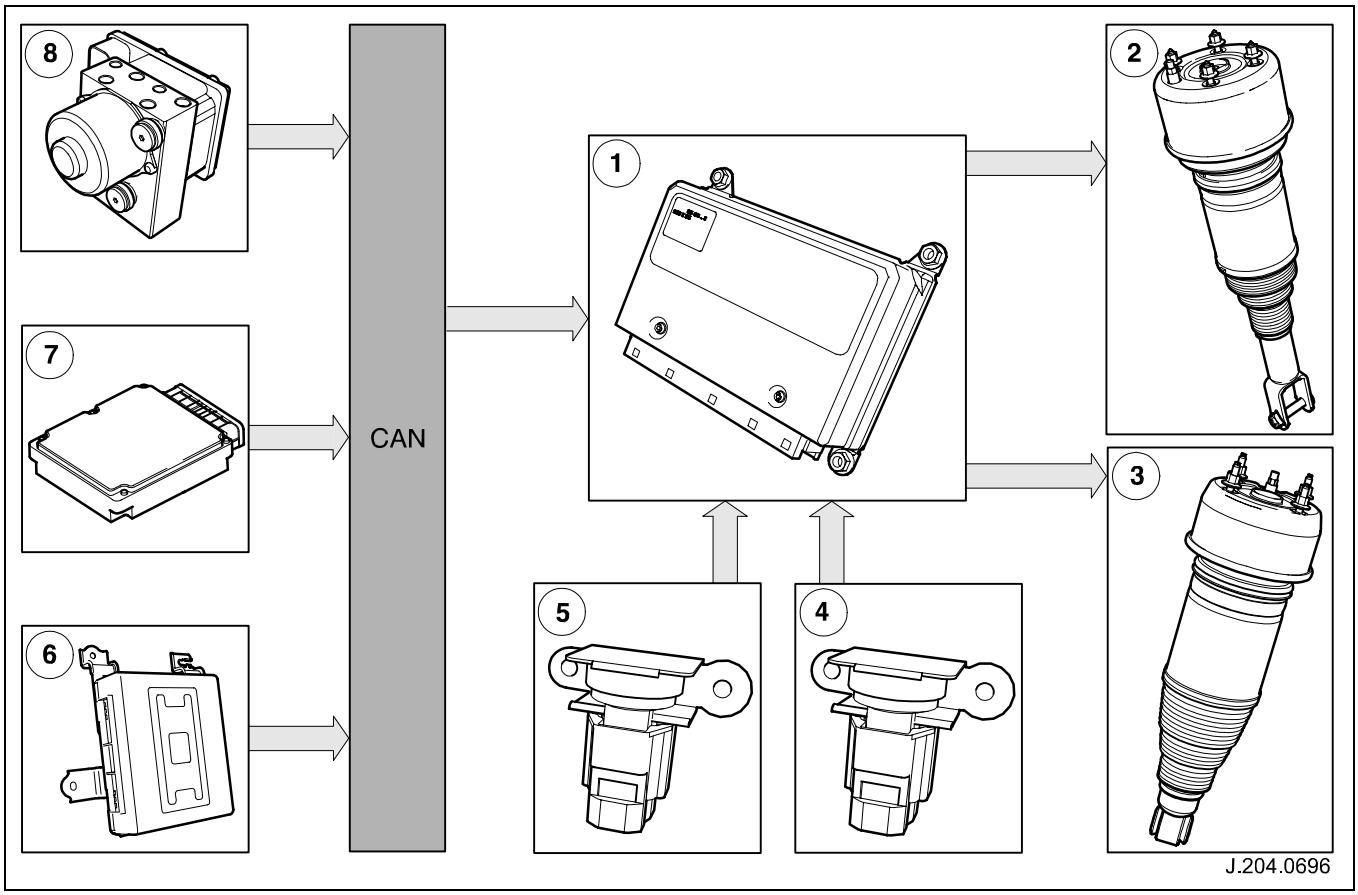


Fig. 11 Control system diagram

1. Air suspension module
2. Front damper (integral with air spring)
3. Rear damper (integral with air spring)
4. Front vertical accelerometer
   - vertical acceleration
5. Rear vertical accelerometer
   - vertical acceleration
6. Climate control module
   - ambient air temperature
7. Engine control module
   - engine speed
   - engine torque
8. ABS module
   - brake line pressure
   - vehicle reference speed
   - lateral acceleration
   - steering wheel angle
   - steering wheel velocity

Adaptive Damping Strategy

The following strategies are an overview only.

Under normal driving conditions, the adaptive damping system adopts the following strategy:

- At system start-up and up to 1 km/h (0.6 mile/h) the system will be set to 'firm'. This is the default setting in the event of a malfunction.
- At 1 km/h (0.6 mile/h) the setting is switched to 'soft' to provide a saloon-ride comfort.
- At speed of 145 km/h (90 mile/h) and above, the system is switched to 'firm'. This setting provides further vehicle stability at higher speeds.

Using the above strategy as a base, the adaptive damping system adopts the following strategies to adjust to changes in vehicle dynamics, road conditions and ambient temperatures:

- Braking
  The front dampers switch to 'firm' slightly before the rear dampers to prevent the front of the vehicle lowering.
- Acceleration
  To maintain optimum vehicle control when accelerating the 'firm' damper setting is adopted.
- Cornering
  The front and rear algorithm improves the stability and comfort performance of the vehicle during cornering:
  - At low speeds, the rear dampers switch to 'firm' slightly before the front dampers to reduce transient understeer.
  - At high speeds, the front dampers switch to 'firm' slightly before the rear dampers to increase transient understeer.

  If the vehicle is still cornering after the front-rear algorithm has finished, the left-right algorithm checks if the inner dampers can be switched to 'soft'. If initiated this further switching helps to generate less motion in the vehicle, and maintains the driven wheels with a more consistent contact with the road surface.
- Long Wave Detection
  The two vertical accelerometers identify natural vehicle-body undulations when the vehicle is traveling on a relatively straight road. In these circumstances, the 'firm' damper setting is adopted as this increases the ability of the vehicle's wheels to follow the contours of the road surface, therefore counteracting vertical-body undulations and increasing tire to road contact. The dampers will switch back to 'soft' when vehicle body undulations subside. The vertical accelerometers are located:
  - Front: right-hand-front wheel arch.
  - Rear: left-hand-side of luggage compartment.

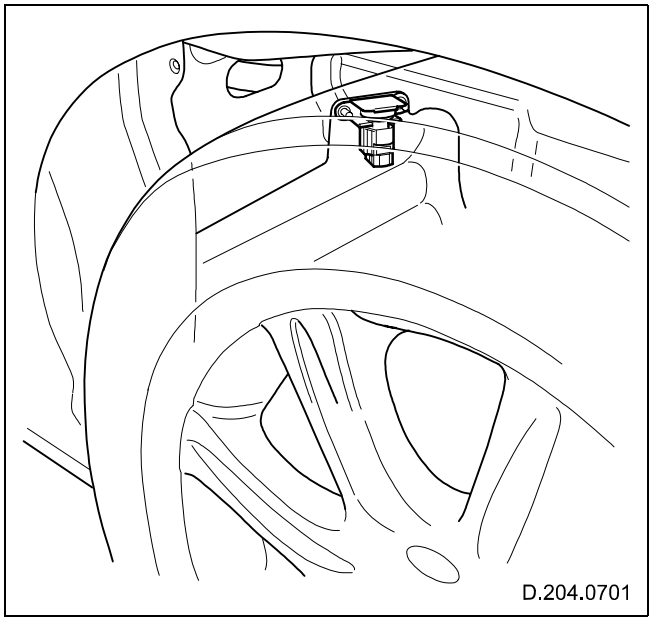


Fig. 12 Front vertical accelerometer

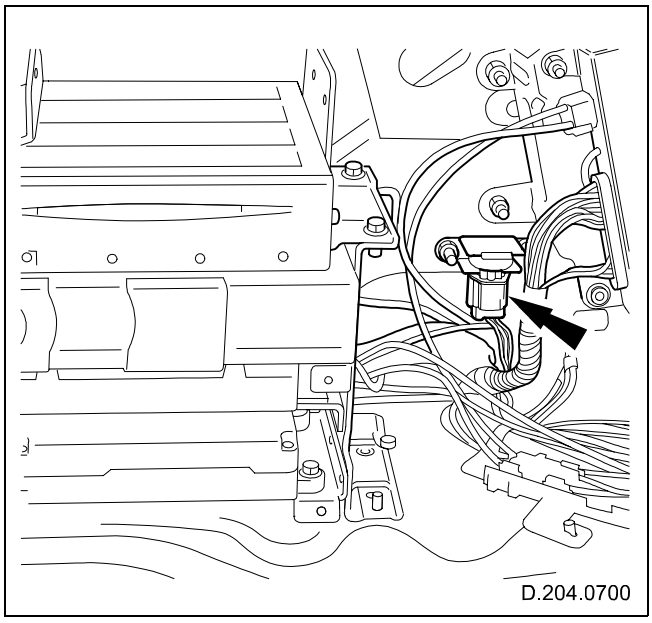


Fig. 13 Rear vertical accelerometer

- Cold Environment
  To improve air-suspension performance in cold environments, when the damper fluid is thick (high viscosity) making damper movement slow, the dampers are switched to the 'soft' setting. This maximizes fluid-flow within the damper when the air-suspension is either lifting or lowering the vehicle. This function operates below a preset vehicle speed and ambient air-temperature.
- System Malfunction
  The 'firm' damper setting provides greater vehicle stability at all driving conditions and has a higher priority than the 'soft' setting. Therefore, in the event of a malfunction in the adaptive damping or air-suspension systems the dampers will default to the 'firm' setting.
- Diagnostics:
  System fault codes are stored in the ASM for diagnosis using worldwide diagnostic system (WDS).

Driveline

Driveshaft

- A new two-piece driveshaft manufactured of lightweight steel is used, which comes in two derivatives to accommodate both powertrain applications:
  - V6 engine with automatic transmission.
  - V8 engine with automatic transmission.
- The driveshaft aligns with the centerline of the vehicle's body and is supported in a rubber center bearing.
- The driveshaft comprises the following:
  - Rubber couplings at each end of the driveshaft.
  - Center Hookes joint.
  - The driveshaft's front-tube is of swage construction, designed to collapse in a controlled manner in the event of the vehicle being involved in a front-end collision.
  - Low friction splines at the center of the driveshaft provide the driveshaft's plunge capability. There is no spline-locking feature on this driveshaft.

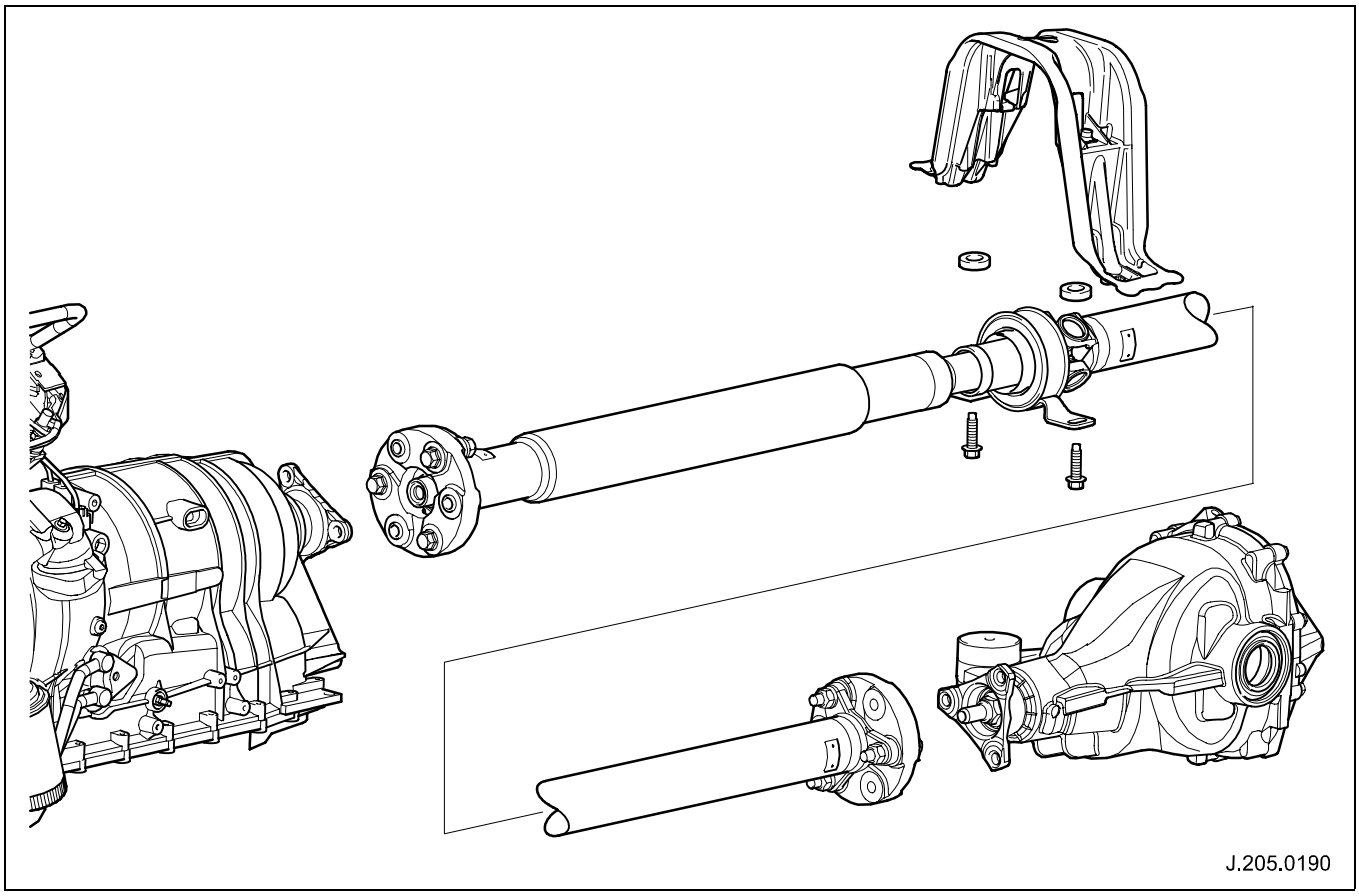


Fig. 14 Driveshaft and final drive unit

Final Drive Unit

- The final drive unit is supported at three mounting points, one at the front of the unit, and two at the rear, through rubber bushes to the vehicle's rear subframe. This mounting arrangement plus the subframe to vehicle-body mounting arrangement, refer to the **Suspension** section, provides the rear driveline with double isolation from the vehicle's body.
- The final drive unit is constructed of a new lightweight cast-iron main casing, with an aluminum rear cover.
- The pinion shaft aligns with the centerline of the vehicle's body and is supported by two taper-roller bearings.
- The hypoid-gear set is supported by taper roller bearings.
- The final drive lubricant is fill for life; the level-plug is located in the rear cover.
- Final drive ratios:
  - V6 3.0 liter - 3.31:1
  - V8 3.5 liter - 3.07:1
  - V8 4.2 liter normally aspirated - 2.87:1
  - V8 4.2 liter supercharged - 2.87:1

Axle Shafts

- There are two derivatives of axle shaft:
  - V6 and V8 normally aspirated engines: tubular axle-shafts including constant-velocity joints with high-torque capacity.
  - V8 supercharged engine: solid axle-shafts including constant-velocity joints with high-torque capacity.
- The left-hand and right-hand axle shafts are different lengths.
- The inboard constant-velocity joint is a sliding arrangement, providing the axle shaft's plunge capability. The outboard constant-velocity joint is fixed.
- The axle shaft is a spline interference-fit into the wheel hub, and a spline slide-fit into the final drive unit retained by a spring circlip.

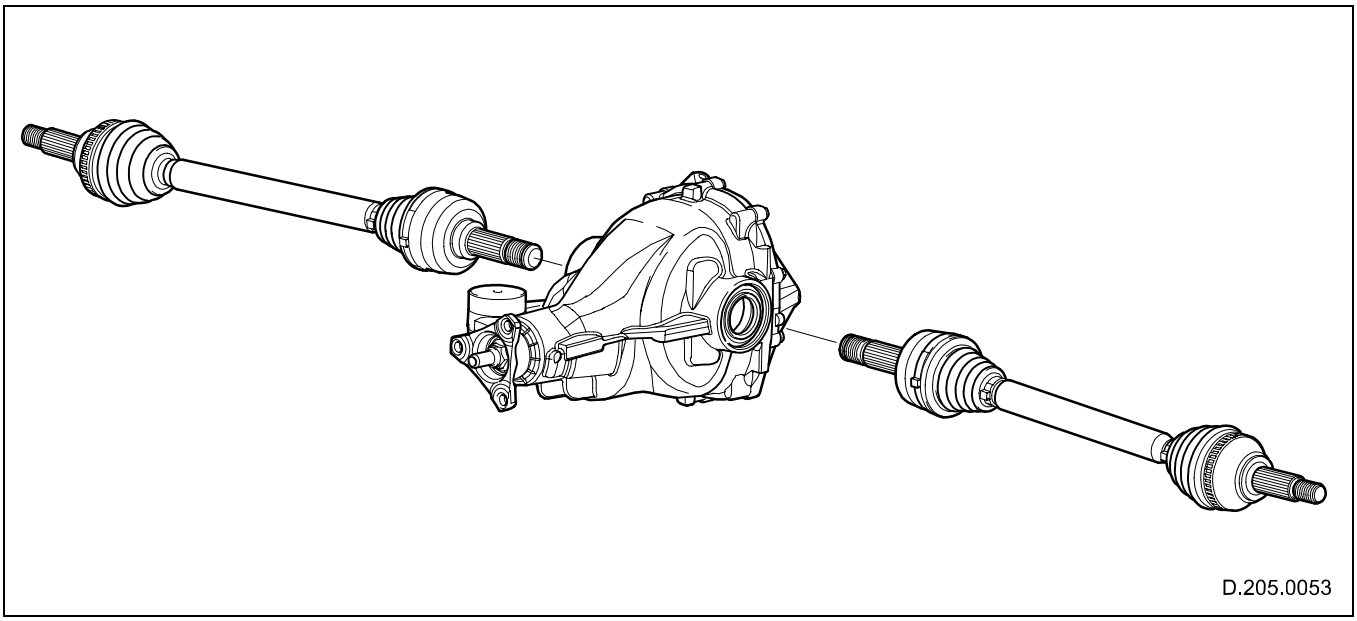


Fig. 15 Axle shafts and final drive unit

Brake System

Introduction

The XJ incorporates a new braking system comprising the following components and functions:

- Panic brake assist.
  - An enhancement to the anti-lock braking system (ABS).
- Dynamic stability control (DSC).
  - Incorporates all new hardware.
- Electric parking brake.
  - Refer to **Electric Parking Brake**.
- Pedal-adjustment system.
  - Refer to **Pedal-adjustment System**.

To complement the new braking system and further enhance the vehicle's braking capability the foundation brakes have also been upgraded:

Front calipers:

- Normally aspirated vehicles incorporate a double-piston sliding arrangement.
- Supercharged vehicles incorporate a Brembo monobloc four-piston fixed arrangement.

Rear calipers:

- Normally aspirated vehicles incorporate a single-piston sliding arrangement with a self-adjusting mechanism.
- Supercharged vehicles incorporate a Brembo two-piece four-piston fixed arrangement; the electric parking brake uses a separate caliper.

Steel-braided brake hoses are installed, providing the following advantages over conventional hoses:

- reduced expansion under pressure,
- light-weight design,
- reduced permeability.

The following table shows the application of the foundation brake components:

Components	Normally Aspirated Vehicles	Supercharged Vehicles
Ventilated Front Discs 320 x 30	X	
Solid Rear Discs 288 x 20	X	
Aluminum Front Caliper	X	
Rear Aluminum Caliper	X	
Brembo Front Ventilated Disc 365 x 32		X
Brembo Rear Solid Disc 330 x 15		X
Brembo Front Caliper		X
Brembo Rear Caliper		X
Electric Parking Brake	X	X
Separate Rear Brake Caliper		X
Steel Braided Hoses - Front and Rear	X	X

Table 3 Brake components

Brake Booster and Master Cylinder

The active brake booster is used to provide the panic brake assist function. The booster also provides improved crash capability, with the elimination of the internal retaining studs as used on the previous booster.

A short-stroke master-cylinder, offering less protrusion from the booster, is incorporated to provide improved packaging and crash performance. The master-cylinder is of tandem design, which in the event of one brake circuit failing, the other circuit will remain operational. An integral fluid-level switch is incorporated in the master-cylinder's reservoir. If brake fluid is low, the brake warning light in the instrument cluster will illuminate and 'LOW BRAKE FLUID' will be displayed in the message center.

The pressure transducer attached to the master-cylinder provides the ABS/DSC module with brake pressure information. This information informs the system how hard the driver is braking and is used as an aid for the DSC to achieve accurate brake pressure control.

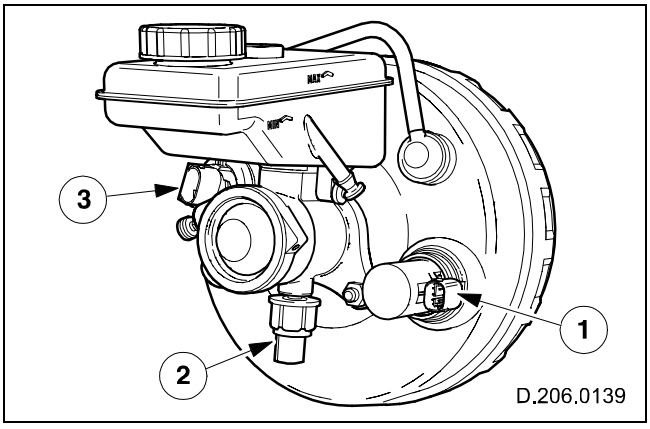


Fig. 16 Active brake booster

1. Diaphragm travel sensor
2. Pressure transducer
3. Solenoid connector

Panic Brake Assist

In an emergency braking situation, a driver presses down on the brake pedal much faster than in normal braking conditions, but often without sufficient force. The initial application of the brake pedal is a reflex reaction. After the initial application, many drivers do not brake hard enough because of concerns that they might cause the vehicle to skid. To aid the driver, the panic brake assist (PBA) intervenes in bringing the vehicle to a halt, sooner and in a controlled manner, in emergency braking situation. The PBA system monitors the speed of brake pedal activation, and at a calibrated pedal activation speed, the PBA provides maximum brake force and makes full use of the ABS.

PBA is controlled by the ABS/DSC module, which monitors a travel sensor attached to the internal vacuum diaphragm of the brake booster. The sensor determines the position of the diaphragm and the speed of the diaphragm movement. If the sensor's signal indicates an emergency braking situation, the ABS/DSC module will open an electric solenoid on the brake booster. The solenoid directs atmospheric pressure into the rear of the brake booster, causing the booster diaphragm to move forward to fully apply the brakes. PBA takes full benefit of ABS to stop the vehicle in a controlled manner and in the shortest distance possible. When the brake pedal is released the ABS/DSC module instantly releases the brakes.

Anti-lock Braking System

The anti-lock braking system (ABS) is a four-channel system having independent inputs from all four-wheel speed sensors. The ABS module, monitors signals from the sensors to calculate: brake slip, acceleration and deceleration of individual wheels. When the brake pedal is depressed, and the ABS module detects incipient wheel lock-up from the incoming signals, it triggers the re-circulation pump inside the module's hydraulic modulator, and the solenoid valves for the wheel(s) concerned. Brake pressure, is then modulated to increase/decrease or remain constant at the wheel(s) concerned until wheel lock-up is eliminated.

The ABS provides self-diagnosis and any malfunction within the system will be indicated to the driver by the illumination of the brake warning light and 'ABS FAULT' displayed in the message center. Should a fault develop within the ABS, the brake system will operate conventionally and with the same standard of performance as a vehicle not equipped with ABS.

Traction Control

Traction control is a function of dynamic stability control (DSC), and is operated in association with the DSC system; refer to **Dynamic Stability Control** 'Driver Interface and Control' subsection.

Traction control prevents excessive wheel-spin at standing starts, or during acceleration. Wheel-spin is usually caused by excessive use of the accelerator pedal, or slippery, loose or bumpy road surfaces. To prevent excessive wheel-spin and maintain vehicle stability such situations are overcome by the intervention of the traction control system by:

- braking the driven-wheel when it starts to slip,
- and/or adapting the engine torque to a level corresponding to the traction available on the road surface.

Functional Description

Traction control uses the ABS electronic and mechanical/hydraulic hardware with additional valves and control to enable the system to generate braking pressure at the calipers. An engine interface also enables the engine to respond to torque reduction requests from the traction control.

As with ABS, the signals from the wheel-speed sensors are supplied to the ABS module, where they are used to calculate the wheel-slip of the individual wheels. Traction control intervention is initiated if the slip at one of the wheels is excessive.

Engine Intervention

In the event of wheel-slip the ABS/DSC module calculates the torque, which should be applied by the engine to reduce the wheel-slip (this torque does not exceed driver demand). Engine torque reduction is then requested from the ECM via the CAN bus. The ECM, in response to these signals, reduces engine torque by controlling the ignition and fuelling.

A traction control gearshift pattern is automatically selected within the automatic transmission software whenever traction control is active.

Brake Intervention

This function operates by increasing the pressure in the brake caliper of the slipping wheel, by closing the separation valve and the inlet valve of the non-slipping wheel and running the modulator pump. This takes fluid from the fluid reservoir via the non-actuated master cylinder and pressurizes the brake caliper. The pressure is modulated at the caliper via the inlet and outlet valves to achieve the desired wheel-slip target to maximize traction.

Dynamic Stability Control

Dynamic Stability Control (DSC) is a closed-loop system designed to enhance driving safety by improving vehicle handling when the tires are at the limits of their grip capabilities. This is achieved through instantaneous electronically controlled reduction of engine torque and strategic application of the brakes at individual wheels.

By using the principle that by controlling the brakes individually it is possible, to an extent, to steer the vehicle. This principle can be used to enhance driving safety by correcting the vehicle's yaw moment (turning force), when the vehicle fails to follow the driver's steering inputs.

Examples of DSC capabilities:

- When the vehicle fails to follow the driver's steering input, the DSC generates precisely defined braking forces at individual wheels to pull the vehicle into line. For example, in a left-hand bend a vehicle that oversteers tends to 'slide out' at the rear wheels. This motion is counteracted by applying the brake at the right-hand front wheel to provide a corrective yaw moment and can reduce side-forces at that wheel in order to stabilize the vehicle.
- Similarly, in the same left-hand bend when the vehicle understeers, the vehicle tends to 'slide out' at the front wheels. Applying the brakes at the left-hand rear wheel to generate a corrective yaw moment to help to turn the vehicle can counteract this motion.
- Even when the tires are at the limits of their grip, such as in sharp steering maneuvers due to driver panic responses, DSC can intervene to reduce the dangers of skidding or breakaway.
- If understeer or oversteer is caused by excessive engine torque, the DSC will reduce the engine torque to provide the corrective yaw moment.

Driver Interface and Control

- DSC is switched 'On' when the engine is started.
- When the system is operating, the DSC light in the instrument cluster will flash, at the rate of twice a second.
- DSC can be switched 'OFF' by pressing the control switch, located on the J-gate surround.
  - The DSC light in the instrument cluster will illuminate continuously when the system is switched 'OFF'.
  - 'DSC OFF' will be displayed in the message center to indicate the system has been switched 'OFF'.
  - If the control switch is pressed again the system will be switched 'ON'.
- A malfunction in the traction control system will be indicated to the driver by the following:
  - The DSC light in the instrument cluster will illuminate continuously.
  - The message 'DSC NOT AVAILABLE' will be displayed in the message center.
- If vehicle speed control is engaged it will automatically disengage when traction control is operating.

Dynamic Stability Control Concept

Satisfactory handling is determined according to whether a vehicle maintains a path, which accurately reflects the driver's input (steering wheel angle) while at the same time remaining stable.

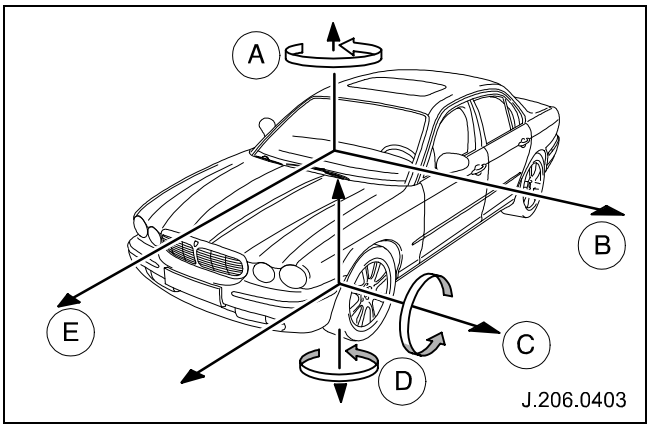


Fig. 17 Vehicle travel directions

A. Yaw rate
B. Lateral acceleration
C. Wheel roll
D. Steering motion
E. Longitudinal acceleration

The ABS/DSC module measures the vehicle's motion using the sensors below and processes the information to maintain vehicle control and stability within its ultimate control limits, which are determined by the physical limits set by the tire's grip.

- Longitudinal acceleration as measured through the wheel speed sensors;
- Lateral acceleration as measured through the lateral acceleration sensor;
- Yaw rate, defined as the rotation around the vertical axis, as measured by the yaw rate sensor.

When there is insufficient tire grip for the driving situation (for example, the driver has entered a corner too fast) the DSC will maintain stability and optimize the cornering and stopping performance, but cannot always prevent the vehicle from running wide.

Driver demand is measured by using the steering wheel angle sensor and vehicle speed to calculate the optimum yaw rate. This is compared to the actual measured yaw-rate and a yaw-rate calculated from the lateral acceleration and the vehicle speed. If the deviation between these measurements is too great, an understeer or oversteer correction is made.

The first step in this process is to determine how the vehicle should respond to driver demand (ideal response) and how it actually does respond (actual response). Hydraulic control valves can then be activated to generate brake pressure and/or engine torque reduction can be used to maintain the difference between the ideal and actual response within a tolerance band. This directly influences the forces on the tires to generate a corrective yaw moment to reduce the side forces of the tires where appropriate.

System Overview

The DSC system embraces capabilities far beyond that of ABS, or ABS and traction control combined, while relying on the components of these systems. It also incorporates these additional sensors for measuring the vehicle's motion and brake system pressure:

- Yaw rate sensor - located to the rear of J-gate in the transmission tunnel;
- Lateral acceleration sensor - integrated with the yaw rate sensor;
- Steering angle sensor - located on the upper steering column;
- Pressure transducer - located on master cylinder.

The ABS/DSC module supports data exchange with other vehicle electronic systems via the CAN; the module also enables diagnostic interrogation using WDS.

The following components register driver demand and the ABS/DSC module processes their signals as a basis for defining an ideal response:

- Electronic engine control system: position of accelerator pedal.
- Brake master cylinder pressure transducer: driver's braking effort.
- Steering angle sensor: position of steering wheel.

There are many supplementary parameters also included in the processing calculations these include the coefficient of friction and vehicle speed. The ABS/DSC module monitors these factors based on signals transmitted by the sensors for:

- wheel speed,
- lateral acceleration,
- brake pressure,
- and yaw rate.

Using these parameters, the function of the ABS/DSC module is to determine the current vehicle status based on the yaw-rate signal and the slip as estimated by the ABS/DSC module. It then maintains the vehicle response within a tolerance of the 'normal' behavior, which is easily controlled by the driver.

In order to generate the desired yaw behavior the ABS/DSC module controls the selected wheels using the ABS hydraulic system and engine control system. In the event of engine intervention the ABS/DSC module calculates the torque which should be supplied by the engine to the wheels, and relays

this request signal to the ECM which implements the torque request.

The electronic engine control system in response to signals from the DSC reduces engine torque in three ways:

- The throttle is positioned to provide the requested engine target torque.
- During the transient phase of torque reduction caused by mechanical and combustion delays, other alternative torque reduction methods are used to provide a quicker response.
  - The ignition is retarded and/or the fuel is cut-off at the injectors at selected cylinders.
- Ignition and fuelling are reinstated when the engine torque, controlled by the throttle reaches the requested value.

Electric Parking Brake

An electric parking brake is fitted as standard to the XJ, providing the following benefits over the conventional parking brake:

- Space - deletion of the conventional parking-brake lever provides more vehicle interior space.
- Ease of use - the electric parking brake does not depend on the strength of the driver to achieve full parking-brake application.
- Safety - the electric parking brake automatically applies when the ignition key is removed.

Overall control of the electric parking brake is via a control module, which controls an actuator unit to operate the rear brake calipers. The control module, depending on the vehicle status, is either functioned by the driver-operated switch, or various control signals to apply or release the parking brake.

Components

The electric parking brake comprises the following components:

- Switch - mounted in the floor console.

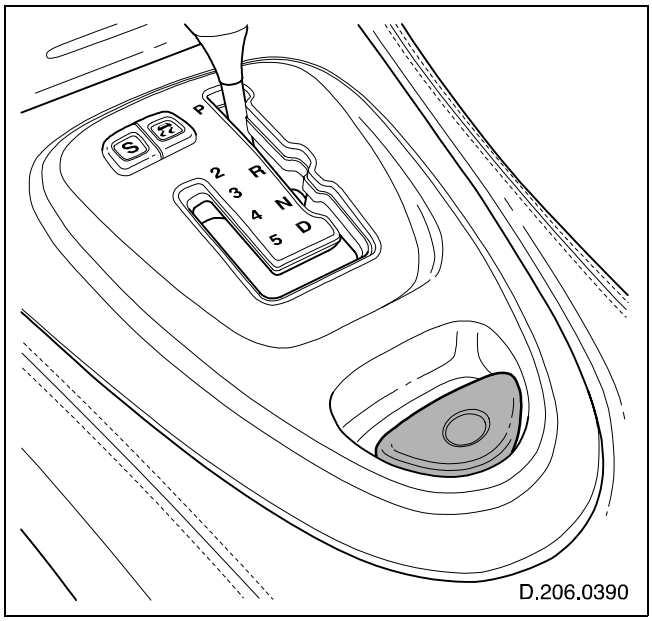


Fig. 18 Parking brake switch

- Parking brake module - located behind the trim, on the right-hand-side of the luggage compartment.

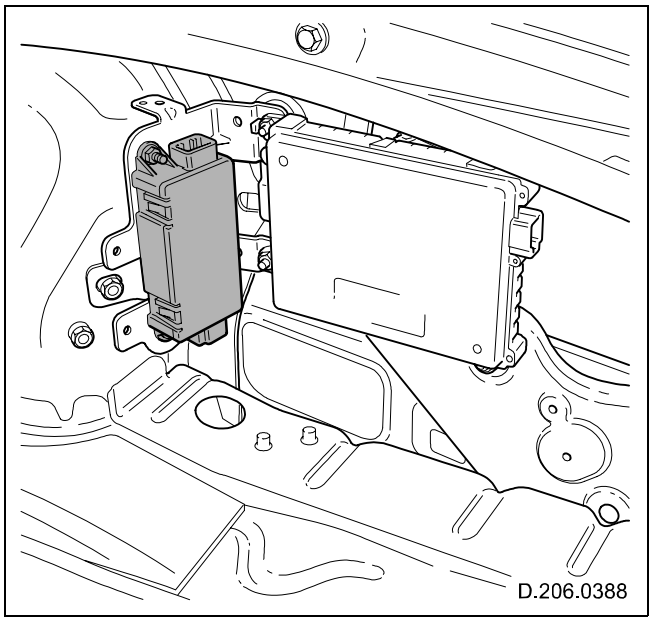


Fig. 19 Parking brake module

- Motorized actuator unit and cables - mounted on the rear subframe.
  - The actuator mounting and cable routing is different on normally aspirated and supercharged vehicles to correspond with the positioning of the calipers.
  - On normally aspirated vehicles, the brake and parking brake caliper is a combined unit.
  - On supercharged vehicles, the brake caliper and parking brake caliper are separate units.

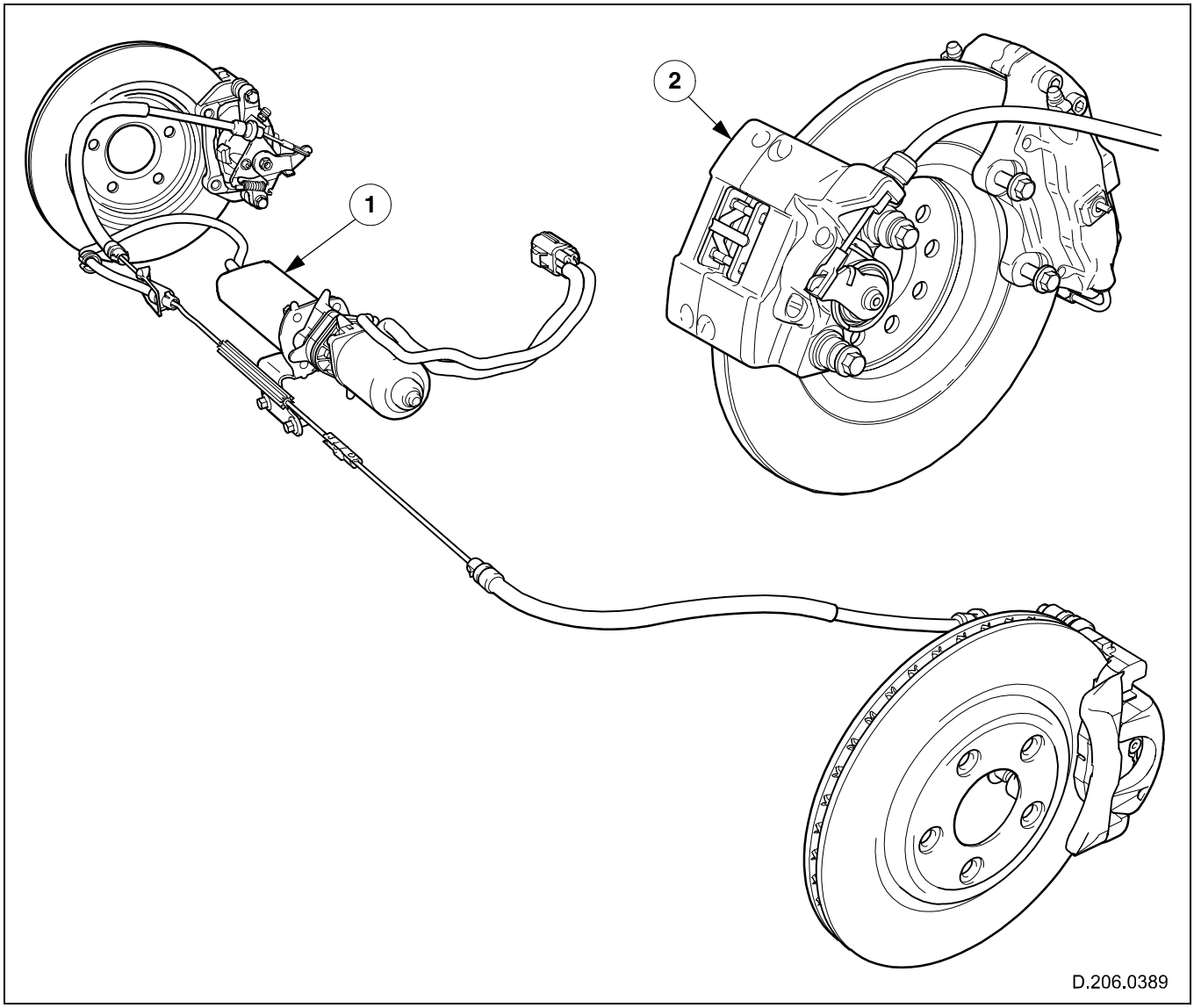


Fig. 20 Actuator unit and cables

1. Actuator unit and cables - normally aspirated vehicle arrangement
2. Parking brake caliper - supercharged vehicle arrangement

Driver Operation

The parking brake switch is mounted on the floor console, to the rear of the gear selector. The switch is a pull/push operation providing the following functions:

Pull up - applies the parking brake.

Neutral - central default position; the switch, when released by the driver, returns to this position regardless of parking brake state.

Push down - releases the parking brake.

The parking brake can be applied in two ways:

1. Pull the switch up and then release. The 'Brake' warning light on the instrument cluster will illuminate to confirm parking brake application.

NOTE: The 'Brake' warning light, on the instrument cluster, will remain illuminated for a short period if the ignition key is turned to position '0' or the key is removed.

2. The parking brake will automatically apply when the ignition key is removed.

The parking brake can be released in three ways:

1. With the ignition switch in position 'II' or with the engine running, apply the footbrake and push the switch down.
2. The parking brake will automatically release when the gear selector is moved from the park 'P' position.
3. With the parking brake applied and the gear selector in either drive 'D' or reverse 'R'. The parking brake will automatically release when the accelerator pedal is depressed.

NOTE: The 'Brake' warning light, on the instrument cluster, will extinguish to confirm parking brake release.

In circumstances when the parking brake needs to be released when the ignition key is removed:

- hold the parking brake switch down,
- at the same time, remove the ignition key.

CAUTION: Ensure the vehicle's wheels are securely wedged, if parking the vehicle with the parking brake released.

Drive-away Release

Drive-away release is activated when the gear selector is in either drive 'D' or reverse 'R' and a positive throttle angle is detected. The ECM, via the SCP BUS, provides the throttle position signals.

Safety Functions

CAUTION: With the exception of emergency conditions, the electric parking brake should not be applied while the vehicle is moving.

If the parking brake is applied while the vehicle is moving, the message 'PARK BRAKE ON' will be displayed on the message center, the 'Brake' warning light will illuminate, and a warning chime will sound.

To release the parking brake while the vehicle is moving:

- Push the switch down to release the parking brake.
- If the switch is in the neutral position after parking brake application, depressing the accelerator pedal will release the parking brake.

Mechanism and Activation

CAUTION: With the exception of emergency conditions, the electric parking brake should not be applied while the vehicle is moving.

There are three modes of parking brake operation dependant on vehicle speed:

- Static - speeds, up to 3 km/h (2 mile/h), in this mode:
  - Pulling-up the switch, results in the parking brake applying at full force.
- Low Speed Dynamic - speeds between 3 and 32 km/h (2 and 20 mile/h), in this mode:
  - The Parking brake applies at full force to the corresponding time the switch is pulled-up and held therefore, the parking brake will apply until the switch is depressed or the vehicle comes to a halt.
- High Speed Dynamic - speeds above 32 km/h (20 mile/h), in this mode:
  - One pull and release of the switch will apply the parking brake for 500 ms. Each subsequent pull and release of the switch will apply the parking brake for 250 ms. Full parking brake force will be achieved at between '3 and 4 pull and releases' of the switch.
  - If the switch is pulled and held the parking brake will be automatically applied in a ramp-up sequence as follows:
  - APPLY for 500 ms,
  - HOLD for 500 ms,
  - APPLY for 250 ms,
  - HOLD for 500 ms,
  - APPLY for 250 ms.
  - This sequence is repeated until full parking-brake load is registered at the control module

Resetting the Parking Brake

If the electrical supply is disconnected from the electric parking-brake module, for example battery disconnection, the actuator will lose its position memory. On battery connection, 'APPLY PARK BRAKE' will be displayed, in the message center, when the ignition is next switched on. This indicates the parking brake requires re-setting.

To reset the parking brake:

- with the foot brake depressed,
- pull-up and release the parking brake switch.

Service

To allow work to be performed on the rear calipers, a special tool is available to release parking-brake cable tension; refer to 'JTIS'.

Parking brake adjustment:

- An initial setting is necessary when replacing the brake pads; refer to 'JTIS'. After the initial setting, the parking brake adjusts automatically with use of the vehicle.

Diagnostics

Diagnosis of the electric parking brake system is achieved using 'WDS'.

Actuator Internals

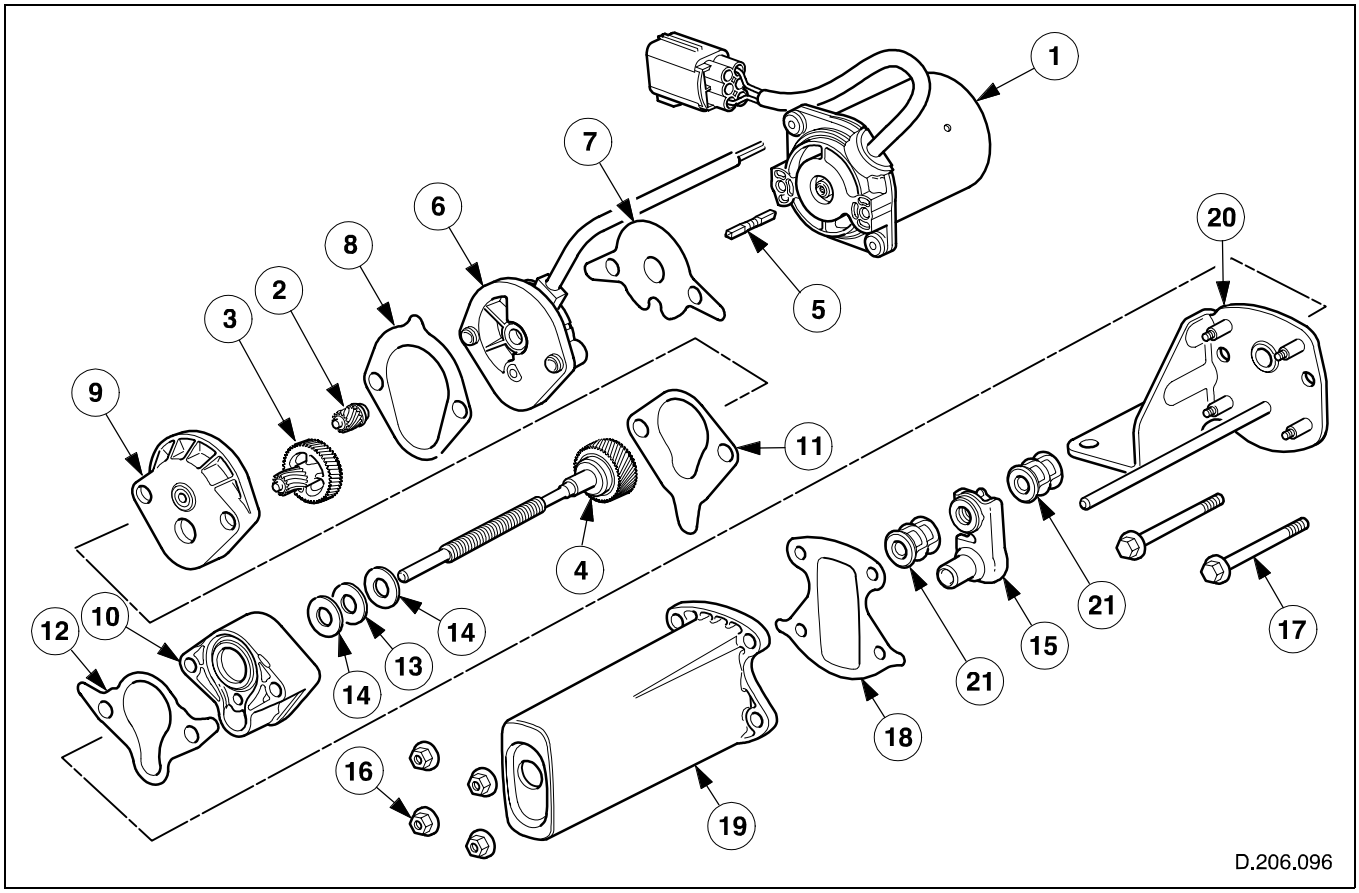


Fig. 21 Motorized actuator unit — internals

1. Motor
2. Gear pinion
3. Idler gear
4. Gear-lead screw
5. Flex shaft
6. End-plate transmission housing
7. Gasket end-plate motor
8. Gasket end-plate housing
9. Transmission housing
10. End-cap transmission housing
11. Gasket end-cap housing
12. Gasket end-cap bracket
13. Thrust bearing
14. Thrust washer
15. Drive nut
16. Nut - cover
17. Bolt
18. Gasket - cover
19. Cover
20. Bracket
21. Bumper

Pedal-adjustment System

The pedal-adjustment system is an optional installation, designed to allow drivers of particular statures, to improve their driving-position.

The system provides a range of adjustments up to a maximum of 2.75in (70mm) and comprises:

- front electronic module (FEM);
- pedal-adjustment motor;
- pedal-adjustment sensor;
- pedal-adjustment switch.

NOTE: The motor and sensor are part of the accelerator-pedal assembly.

The front electronic module (FEM) controls the position of the pedals by providing an electrical output signal to the motor, in response to the:

- current position of the pedal-adjustment position sensor;
- pedal position chosen by the driver (using the pedal-adjustment switch).

NOTE: Using the driver switchpack, three different pedal-position settings may be stored in the vehicle memory-system.

Fig. 22 shows the basic system interconnections; refer to **New XJ Range Electrical Guide** for detailed information.

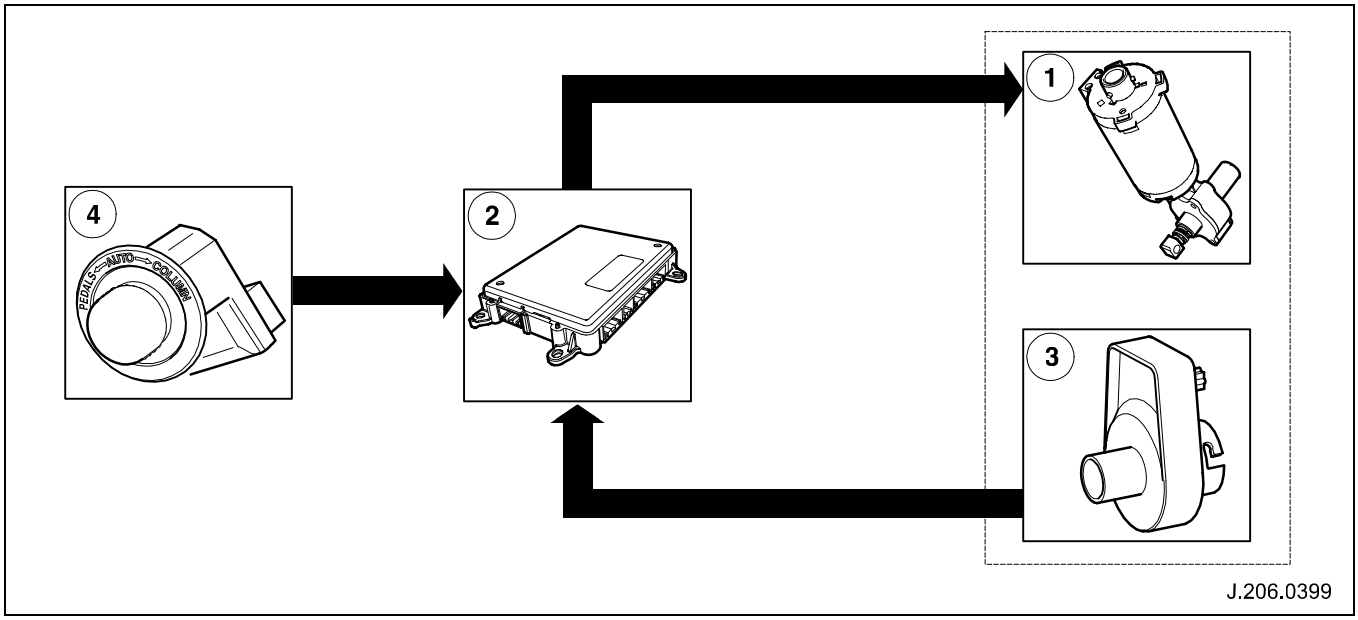


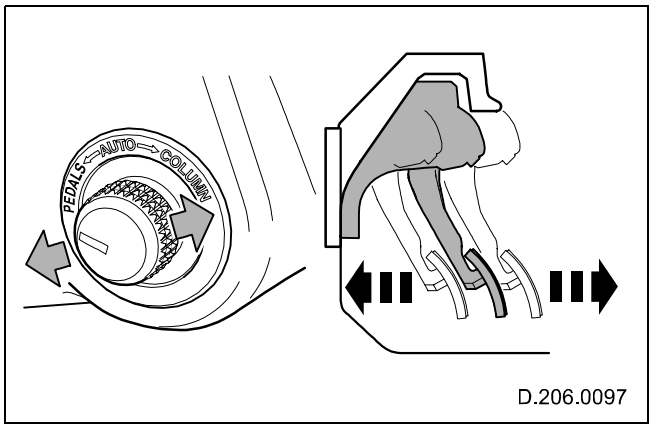
Fig. 22 Pedal adjustment system

1. Pedal-adjustment motor
2. Front electronic module
3. Pedal-adjustment position sensor
4. Pedal-adjustment switch

The pedal-adjustment system:

- can be activated when the ignition key is in any position;
- cannot be activated when the ignition key has been removed;
- is inhibited during the operation of the adaptive speed control (where installed);
- requires initialization after any component of the system has been replaced; refer to **JTIS**.

NOTE: Diagnostics should be undertaken using WDS.



Pedal adjustment is enabled by setting the 3–way, rotary switch situated on the left-hand side of the steering column, to the appropriate position. Pedal adjustment is then controlled by operating the switch upwards, for pedals 'out' and downwards for pedals 'in'.

The pedal-adjustment motor connects directly to the accelerator-pedal module; a flexible drive-cable connects the motor to the pedal-adjustment drive-gear.

Fig. 23 Pedal-adjustment switch

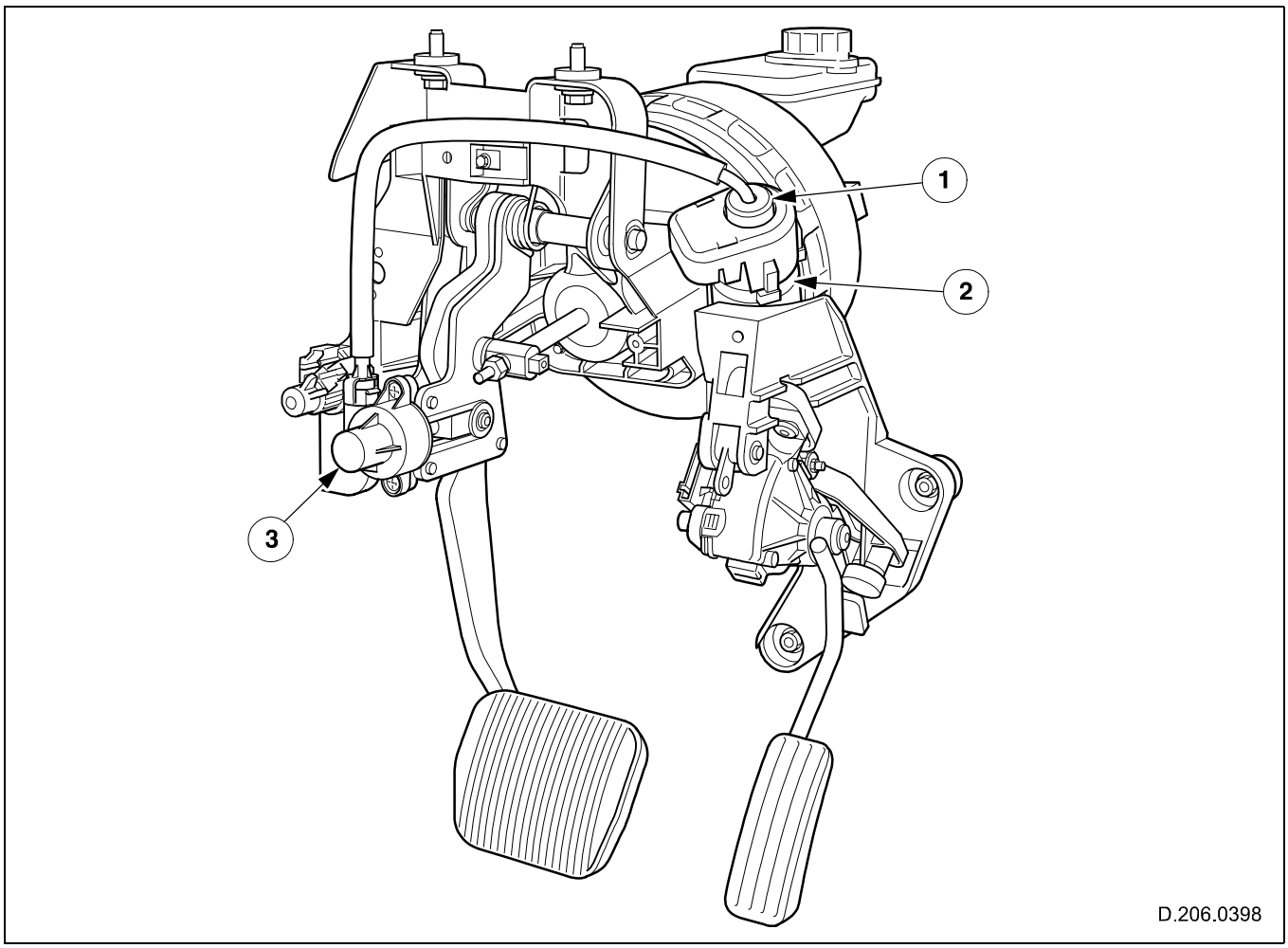


Fig. 24 Pedal-adjustment assembly

1. Pedal-adjustment position sensor
2. Pedal-adjustment motor
3. Brake-pedal adjustment drive-gear cover

Steering System

Introduction

An enhanced steering system is introduced into the XJ Range, which when combined with changes made to the suspension system provides excellent steering response and feel. The steering system is also specially tuned to complement the suspension changes, providing a further enhancement to the vehicle's ride characteristics; refer to **Suspension**.

Changes made to the steering system include:

- New upper steering column, refer to **Steering Column** below.
- New lower steering column, refer to **Steering Column** below.
- The hydraulic pressure switches have been removed from the high-pressure hoses; functionality is now integrated into the front electronic module (FEM), providing a faster response time; refer to **Servotronic Power Steering** below.
- All XJ models share the majority of steering system components, with the main exception of the pump pulley, which is smaller on the V8 derivative.

Servotronic Power Steering

The Servotronic power steering system operates using a conventional hydraulically operated rack and pinion, equipped with a rotary valve and added electronics to control the system's hydraulics. This system provides the driver with steering assistance proportional to the vehicle's speed:

- with full hydraulic power assistance provided at low vehicle speeds, for example when parking the vehicle, and
- a gradual reduction of hydraulic steering assistance as the vehicle speed increases, allowing the driver a precise feel of road contact.

The operating function of the Servotonic system is explained below:

- Road speed data, as measured by the electronic speedometer is transmitted to the FEM by the instrument cluster, via the SCP bus.
- Using the variable assisted power steering (VAPS) curve data stored within its memory, the FEM calculates the amount of current needed to supply the VAPS solenoid, which is an integral part of the Servotronic transducer.
- Based on the amount of current received from the FEM, the VAPS solenoid controls the hydraulic reaction of the rotary valve.
- This hydraulic reaction determines the amount of torque (effort) the driver needs to apply to the steering wheel at various vehicle speeds.

A further advantage of the Servotronic system is the fact that the oil pressure and flow are never reduced and can therefore be utilized immediately in emergencies, where sudden and unexpected steering corrections become necessary.

The power steering pump is mounted to the engine and is driven by the accessory drive belt. The pump provides a constant flow rate of 7.5 liters per minute and has a maximum pressure of 110 bars. The fluid reservoir incorporates a 10-micron internal filter to ensure cleanliness of the system.

Steering Rack

The steering rack is a variable ratio design, providing ease of parking maneuverability while maintaining the on-center steering precision required at high vehicle speeds. The steering rack is a compact unit, mounted via dual-rate rubber bushes to the rear of the vehicle's front subframe. The rotary motion of the steering-wheel is transformed by the pinion into the axial motion of the rack. The tie rods, attached at each end of the steering rack, transmit the steering motion to the wheel knuckles. From lock-to-lock the steering rack requires 2.8 turns of the steering wheel.

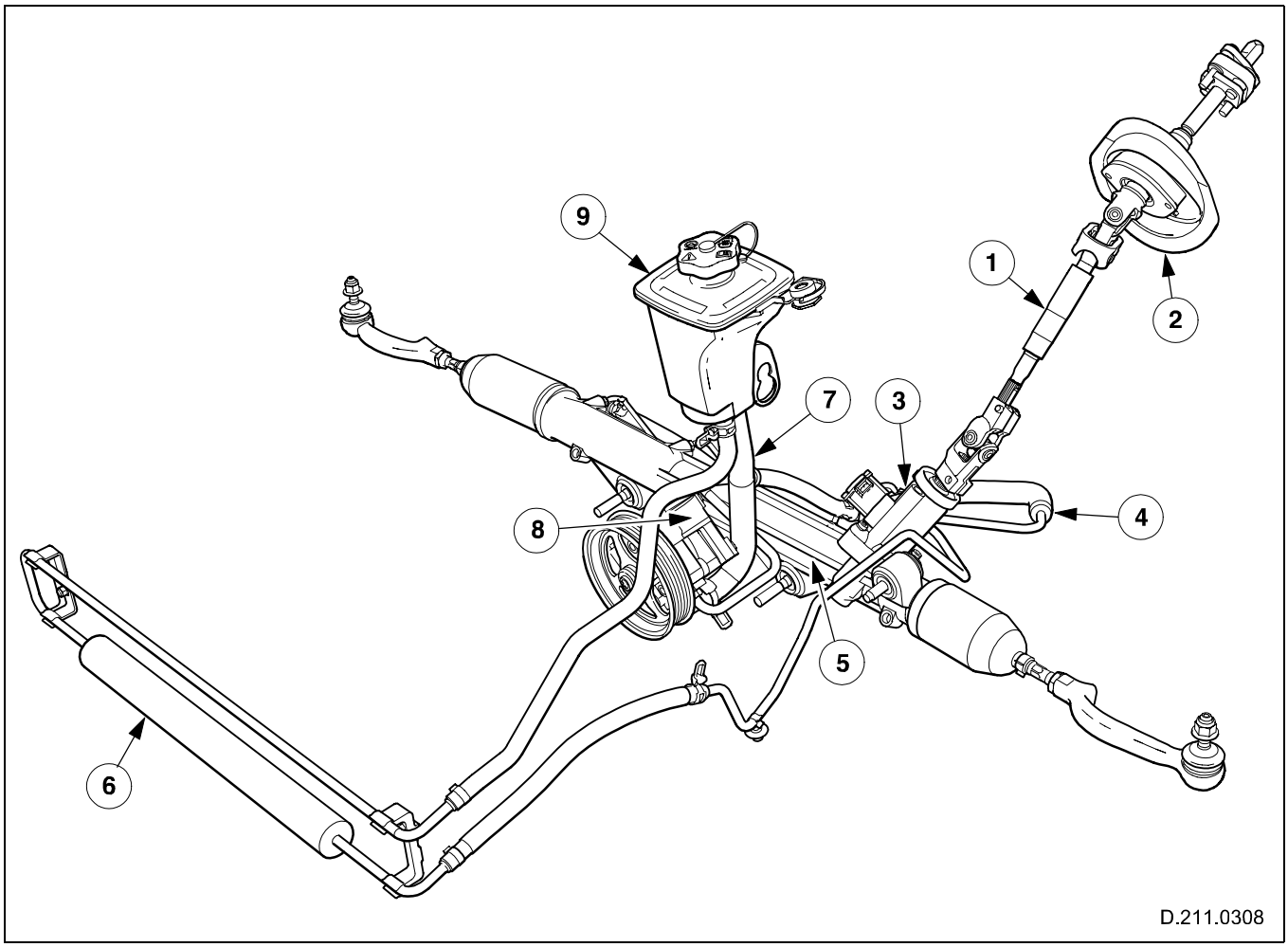


Fig. 25 Steering system assembly — V8 derivative shown

1. Lower steering column
2. Body seal and bearing
3. Rotary-valve housing and Servotronic transducer
4. High-pressure feed line
5. Steering rack
6. Fluid cooler
7. Suction hose
8. Power steering pump
9. Fluid reservoir

Steering Column

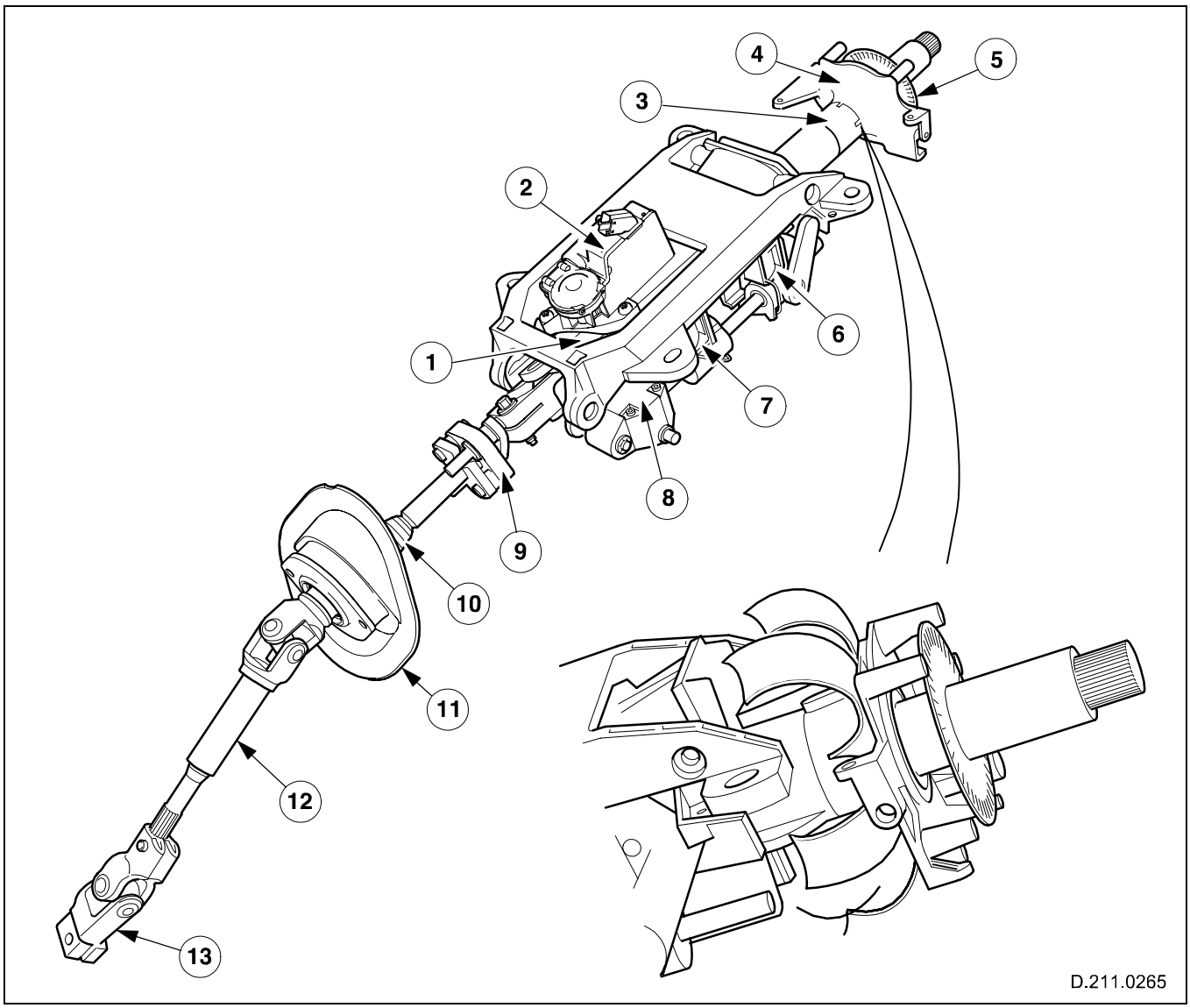


Fig. 26 Steering column

1. Upper column
2. Column lock
3. Peeling-tube crash mechanism
4. Crash adaptor
5. Sensor ring — dynamic stability control
6. Rake adjustment housing, lever and solenoid
7. Reach adjustment housing and solenoid
8. Adjustment motor
9. Rubber NVH isolator
10. Lower column
11. Body seal and bearing
12. Collapsible mechanism
13. Universal-joint

Upper Steering Column

- The upper column is a new design attached to the in-vehicle cross-member.
- A unique crash-load absorption system is provided by a peeling-tube mechanism; refer to **Fig. 26**.
- The column is equipped with a sensor ring, which is monitored by the steering angle sensor for dynamic stability control (DSC) functionality.
- All steering column electrical connections are via a single ten-way connector module, mounted on the side of the column.
- Steering column adjustment is calibrated at vehicle production. If either the column or the instrument cluster is replaced in service, the steering column adjustment range must be calibrated using WDS.

Column Adjustment

A single motor provides the drive for both the reach and rake adjustment of the column:

- reach adjustment is +/- 25 mm from the nominal setting,
- rake adjustment is +/- 2.5 degrees from the nominal setting.

The steering column is adjusted for reach and rake by operating the four-way control switch on the steering column; refer to **Fig. 27**.

Steering column adjustment:

- Moving the switch forwards and backwards controls reach adjustment.
- Moving the switch up and down controls rake adjustment.

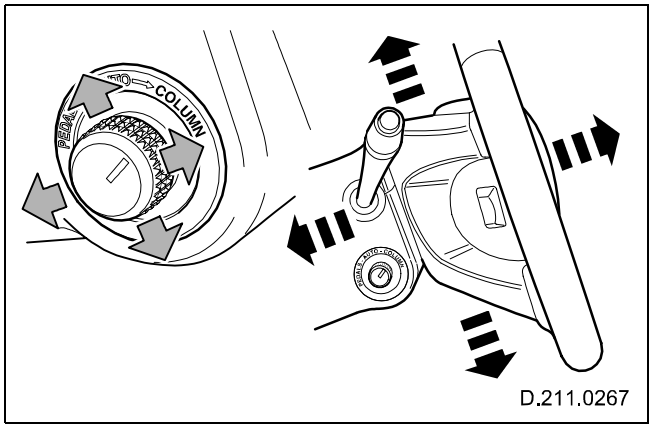


Fig. 27 Steering column adjustment

Driver Position Memory System

The driver-position memory system, functioned by the instrument cluster, stores three column positions that can be recalled in conjunction with the driver position setting, plus an entry/exit mode to give the driver maximum room to enter and exit the vehicle.

The entry/exit mode is selected by setting the steering column adjustment switch to the 'AUTO' position. When the ignition key is removed the steering column will move to the uppermost rake position.

Refer to vehicle owner literature for further information on the above memory functions.

Steering Column Lock

The steering lock is remote from the ignition switch and controlled electronically. The lock engages when the ignition key is removed; the lock disengages when the key is placed in the ignition switch.

Steering Column Shrouds

The shroud comprises an upper and lower section. Contained in the lower shroud is an energy absorbing foam-pad/spreader plate to optimize leg protection in the event of an accident.

NOTE: If the foam pad shows signs of damage, the lower shroud assembly must be replaced.

Lower Steering Column

- The lower column incorporates a new crash-collapse mechanism in the lower section. It is a tube-in-tube arrangement, where the inner tube is designed to breakaway from the crimped fixing of the outer tube at a predetermined load.
- The rubber isolator is part of the lower column, and is located in the column's upper section. The isolator controls axial and torsional movements between the steering and suspension systems while also providing noise, vibration and harshness (NVH) damping.
- The body bearing seal is part of the lower column assembly.
- The lower steering column attaches to the steering-rack's pinion via a universal joint.

V6 Engine

Introduction

The 3.0 liter AJ-V6 engine is introduced into the XJ Range, which when combined with the lightweight aluminum body provides excellent performance and economy figures. The engine performance figures have mainly been achieved by the use of continuous variable valve timing on the intake camshafts to provide optimum engine torque over a wide-range of engine speeds. Continuous variable valve timing was first used on the V6 in the X-TYPE and later the S-TYPE.

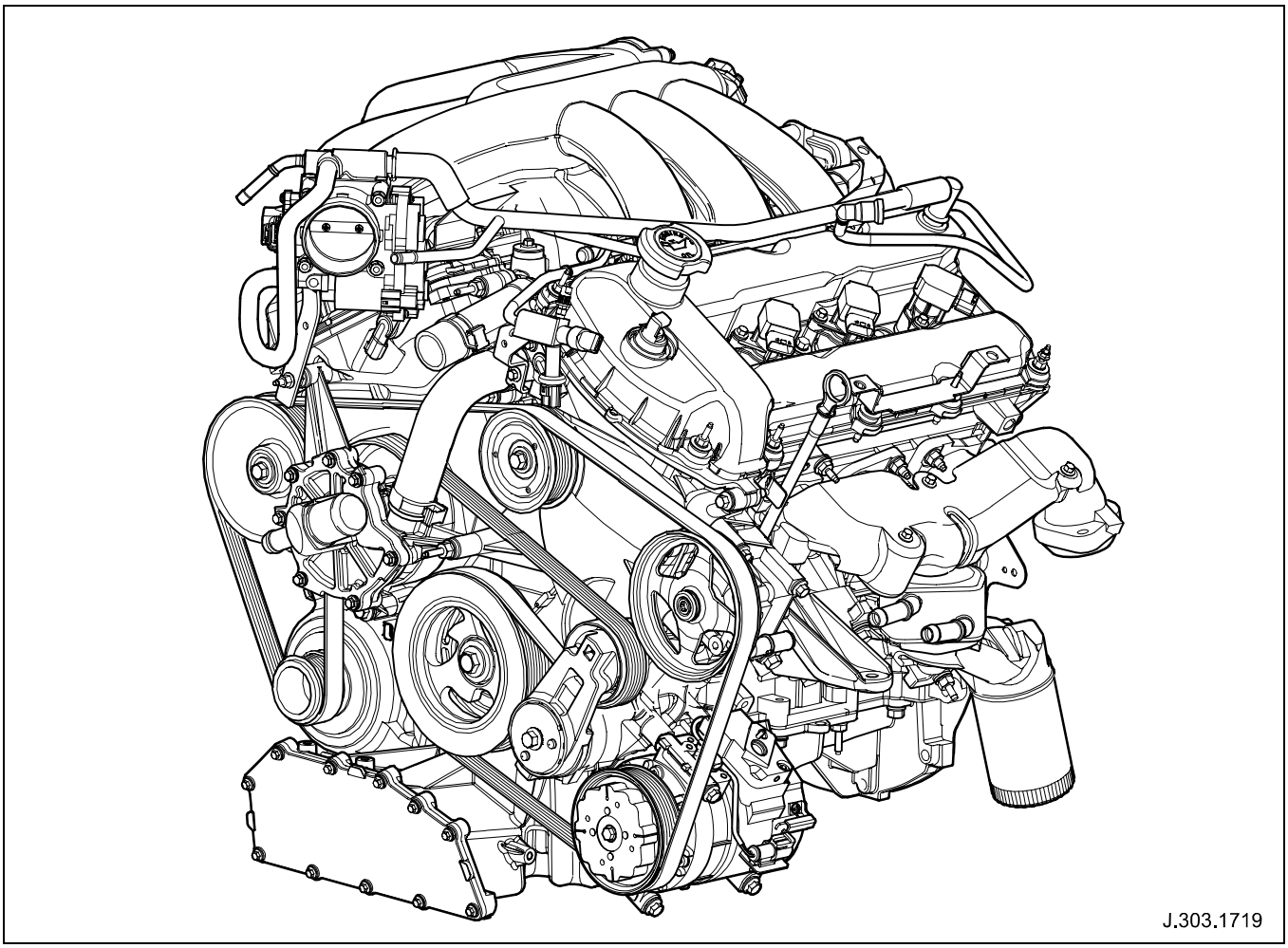


Fig. 28 V6 engine

Engine Components

The engine is a water-cooled six-cylinder unit, arranged in two planes in a 60 degree 'V' configuration, comprising:

- A lightweight aluminum cylinder-block with dry steel-liners.
- Aluminum pistons with valve cutouts in the crown to accommodate the advanced inlet timing of the variable valve timing system.
- A cylinder bore of 89 mm and piston stroke of 79.5 mm, provides:
  - 2967 cm³ engine capacity, and a
  - 10.5:1 compression ratio.
- A steel crankshaft supported by four main-bearings.
- Sinter forged and fractured split connecting rods.
- A lightweight aluminum, engine-bedplate design, which combined with the inherent strength of the compact V6 configuration, minimizes vibration, increases torsional stiffness, and enhances engine refinement.
- Aluminum cylinder heads with precision cooling technology and square squish chambers to provide optimum economy and emissions.
- Continuously variable valve timing on the intake camshafts, refer to **Continuous Variable Valve Timing** below.
- Two chain-driven, overhead-camshafts per bank.
- Four-valves per cylinder, activated by direct acting mechanical bucket tappets with top mounted steel shims.
- Single spark plug positioned central to each of the cylinder's four valves.
- Crankshaft mounted oil-pump, providing increased-flow characteristics to supply the requirements of the variable valve timing system.
- Magnesium camshaft covers with rubber seals to reduce airborne noise.
- An extensive use of aluminum, and some magnesium components to minimize engine weight.
- A positive crankcase ventilation (PCV) valve, which regulates crankcase depression, and controls the flow of crankcase gases into the intake manifold and oil separator. The PCV valve is located in the bank-2 camshaft cover.

Continuous Variable Valve Timing

The continuous variable valve timing (VVT) used on this engine is a further development of the two-positional system. Where instead of selecting one of two possible intake camshaft positions, the continuous system operates over a range of 30 degrees and is advanced or retarded to the optimum angle within this range. Providing improved low and high-speed engine performance and excellent idle quality.

The VVT system changes the phasing of the intake valves, relative to the fixed timing of the exhaust valves, to alter:

- the mass of airflow into the engine's cylinders,
- the engine's torque response and emissions.

The VVT unit uses a vane device to control the camshaft angle, refer to **VVT Operation** below.

The VVT is controlled by the engine control module (ECM), which uses engine control signals pertaining to engine speed and load, plus engine oil temperature to calculate the appropriate camshaft position.

The continuous VVT system provides the following advantages over the two-positional system:

- Reduces engine emissions and fuel consumption by further optimizing the camshaft timing, this improves the engine's internal exhaust gas recirculation (EGR) effect over a wider operating range, therefore eliminating the need for an external EGR system.
- Improved full-load torque characteristics as the camshaft timing can be optimized at all engine speeds for superior volumetric efficiency.
- Improves fuel economy by optimizing torque over the engine's speed range, this is not fully achievable with the two positional system.

The system also has the added benefits of operating at a lower oil pressure and faster response time.

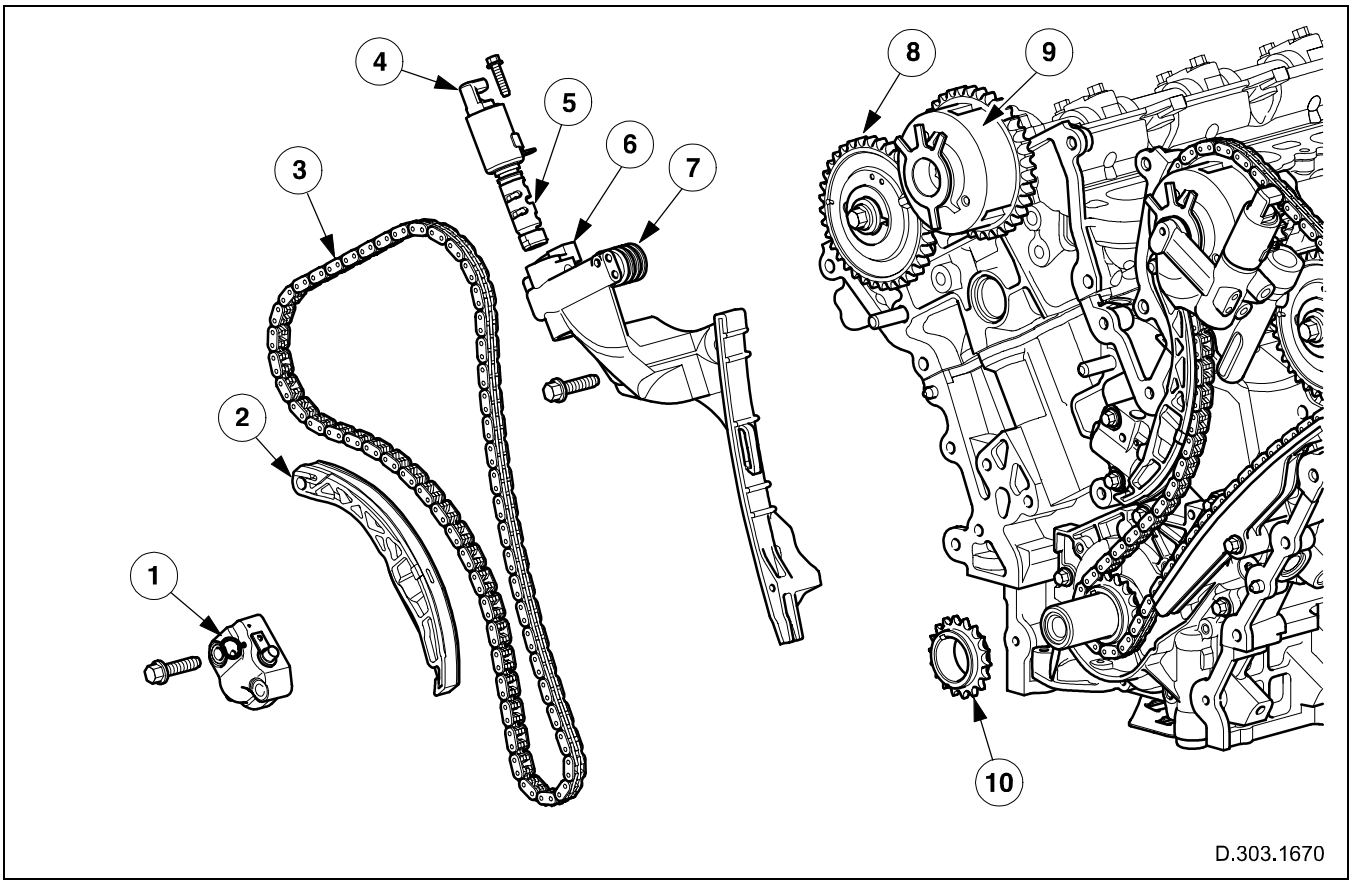


Fig. 29 Timing mechanism

1. Tensioner
2. Tensioner arm
3. Timing chain
4. Oil control solenoid
5. Shuttle valve
6. Bush carrier and chain guide
7. Oil feed bush
8. Exhaust camshaft sprocket
9. VVT unit - intake camshaft
10. Crankshaft sprocket

VVT Operation

The VVT unit is a hydraulic actuator mounted on the end of the intake camshaft, which advances or retards the intake camshaft timing and thereby alters the camshaft to crankshaft phasing. The oil control solenoid, controlled by the ECM, routes oil pressure to either the advance or retard chambers located either side of the four vanes interspersed within the machined housing of the unit.

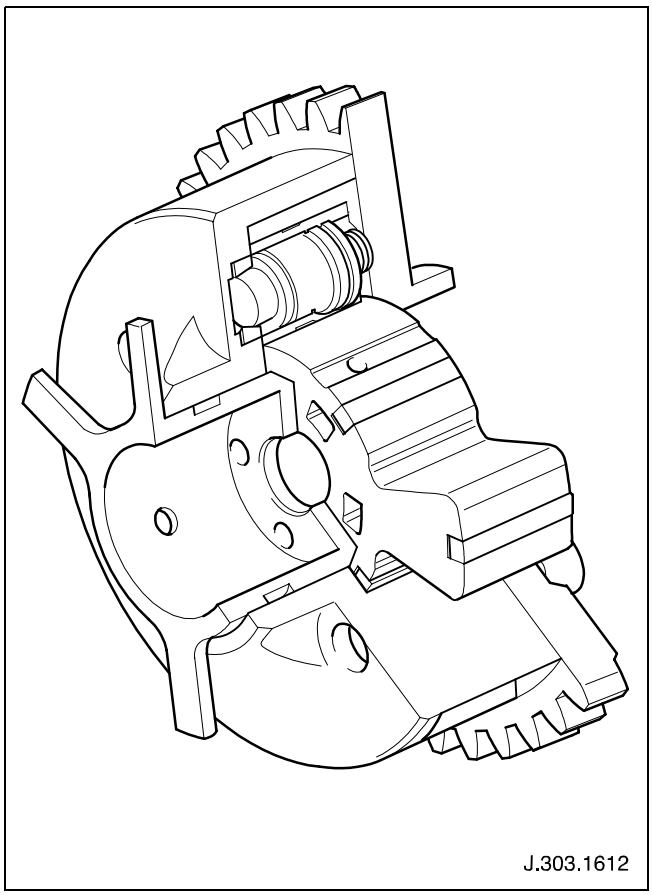


Fig. 30 VVT unit

The timing chain drives the VVT unit, which rotates relative to the exhaust camshaft sprocket. When the ECM requests the camshaft timing to advance, the oil control solenoid is energized moving the shuttle valve to the relevant position to allow engine oil pressure, via a filter, into the VVT unit's advance chambers. When the camshaft timing is requested to retard the shuttle valve moves position to allow oil pressure to exit the advance chambers, while simultaneously routing the oil pressure into the retard chambers.

When directed by the ECM the VVT unit will be set to the optimal position between full advance and retard for a particular engine speed and load. This is achieved by the ECM rapidly pulsing the energizing signal to the oil control solenoid. Due to this rapid pulsing the shuttle valve assumes a position between the limits of its travel and is continuously controlled by the ECM to maintain the requested camshaft angle. The actual position of the intake camshaft is monitored by the camshaft position sensor, which transmits signals to the ECM.

Engine oil properties and temperature can affect the ability of the VVT mechanism to follow demand changes to the cam phase angle. The VVT system is normally under closed-loop control except in extreme temperature conditions. For example, at very-low oil temperatures, such as cold starts below 0^{c} Celsius, movement of the VVT mechanism is sluggish due to increased viscosity and may have to be limited by the ECM. Similarly, at extremely high oil temperatures the ECM may have to limit the amount of VVT advance to prevent the engine from stalling when returning to idle speed.

V8 Engine

Introduction

Two new V8 engines are introduced into the XJ Range:

- The AJ-V8 4.2-liter, an upgrade and replacement of the previous 4.0-liter engine, is available in both normally aspirated and supercharged variants. Jaguar first introduced this engine in the S-TYPE.
- The AJ-V8 3.5-liter, an upgrade and replacement of the previous 3.2-liter engine, is available as normally aspirated only. The 3.5-liter engine makes its Jaguar debut in the XJ Range.

Improvements made to the engines provide excellent performance data, and when combined with the lightweight aluminum body of the XJ produces best-in-class performance, economy, and refinement figures.

Engine Data

- AJ-V8 4.2-liter engine:
  - cylinder bore: 86 mm
  - piston stroke: 90.3 mm
  - engine capacity: 4196 cm^3
  - compression ratio - normally aspirated: 11.0:1
  - compression ratio - supercharged: 9.0:1
- AJ-V8 3.5-liter engine:
  - cylinder bore: 86 mm
  - piston stroke: 76.5 mm
  - engine capacity: 3555 cm^3
  - compression ratio: 11.0:1

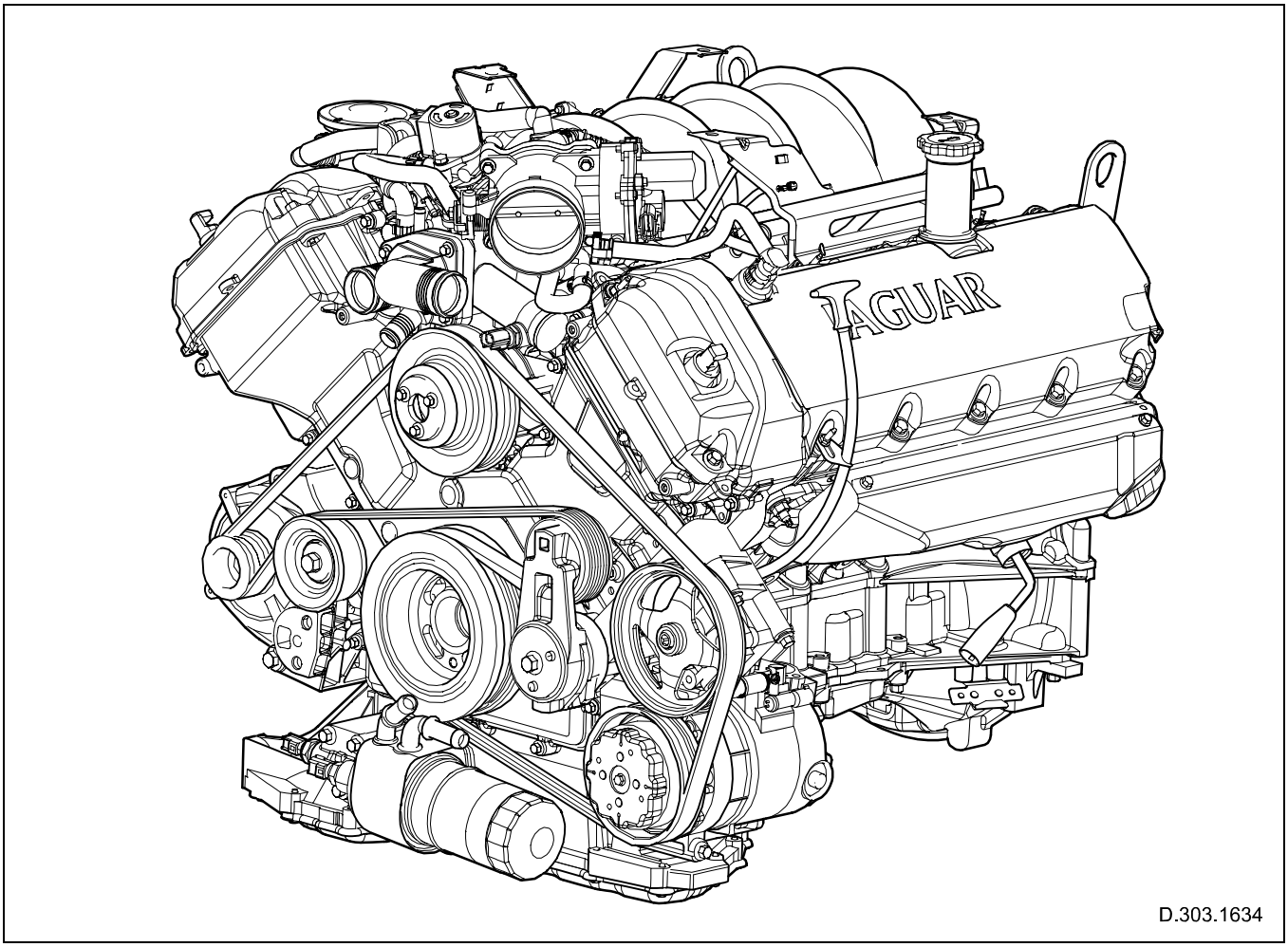


Fig. 31 V8 normally aspirated engine

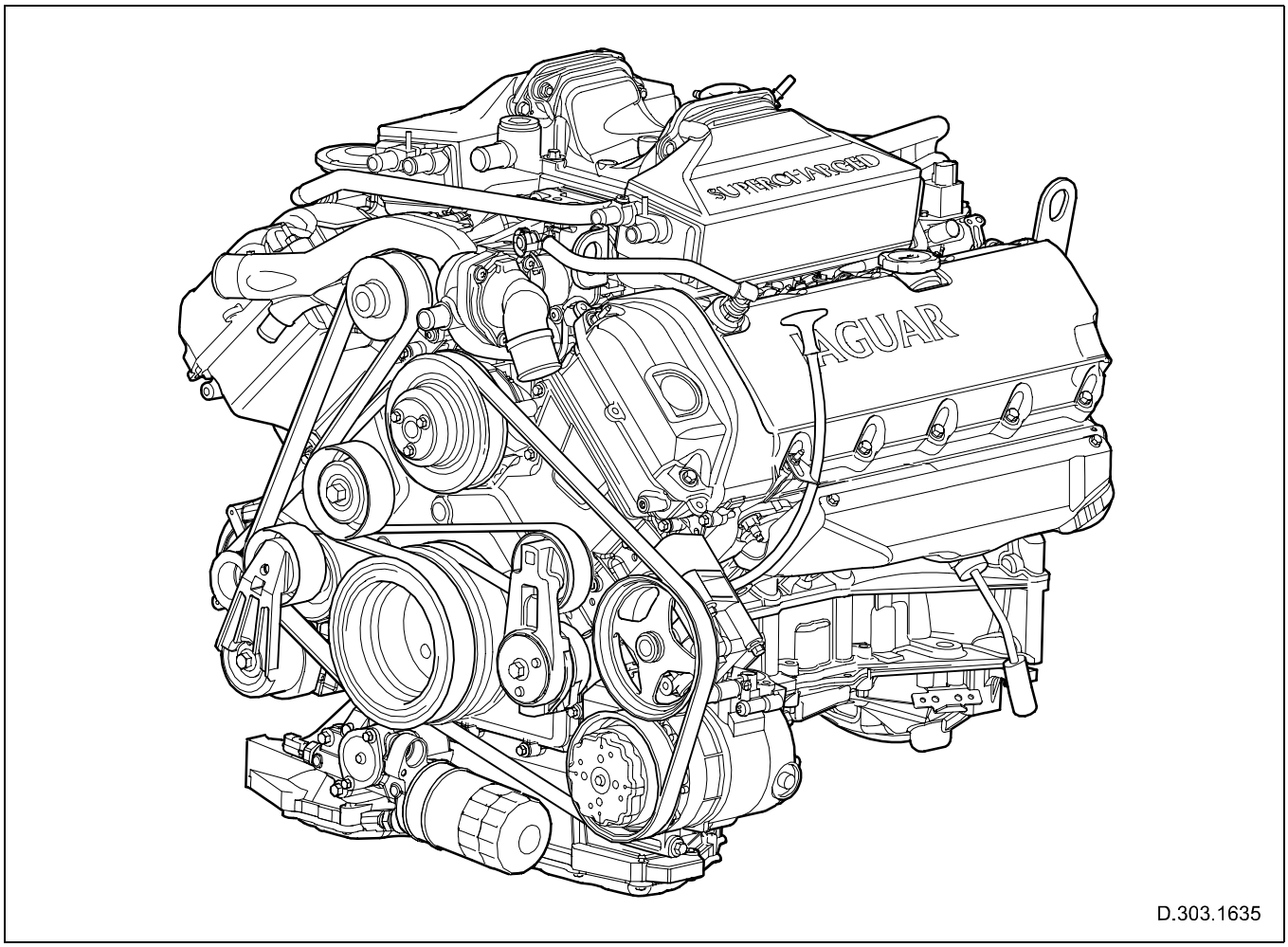


Fig. 32 V8 supercharged engine

Engine Components

The water-cooled engines, are constructed of aluminum alloy with eight cast-iron cylinder liners, arranged in two-planes in a 90-degree 'V' configuration. An extensive use of aluminum and some magnesium-alloy engine components provides a low engine-weight. The 3.5-liter and 4.2-liter engines share the majority of engine components.

New and upgraded engine features are discussed in this section.

Cylinder Heads

The cylinder heads are unique to each cylinder bank and incorporate, two chain-driven overhead camshafts per-bank, which activate four-valves per cylinder via direct acting bucket tappets. The cylinder heads have been modified as follows:

- Adapted intake ports improve volumetric efficiency.
- Redesigned combustion chambers with the inclusion of 'squish' areas around the valves improve economy and emissions.
  - The 'squish' area is a raised feature on the periphery of the piston crown, which enables the piston to get within approximately 1mm distance of the cylinder head at TDC compression. At TDC, the 'squish' area forces the fuel/air charge into the center of the combustion chamber with significant turbulence to aid combustion.
- New thinner cylinder head gaskets, constructed from multi-layer steel with sintered steel combustion rings.
- The engine lifting-eye, which was part of the cylinder-head cast, is replaced by a threaded hole to accept a steel lifting-bracket.

Pistons

The pistons are a lightweight design with reduced crown height. A new piston ring pack is introduced to contain increased combustion gas-pressure and enhance temperature performance.

- The normally aspirated pistons are cast aluminum with a three-piece oil control ring.
- For improved robustness and to withstand mechanical and thermal stresses, the supercharged pistons are manufactured of forged aluminum with a two-piece ultra compact oil control ring.
  - The supercharged engine also employs piston-cooling jets, which inject oil on the underside of the piston's crown to provide improved temperature control; refer to **Fig. 33**

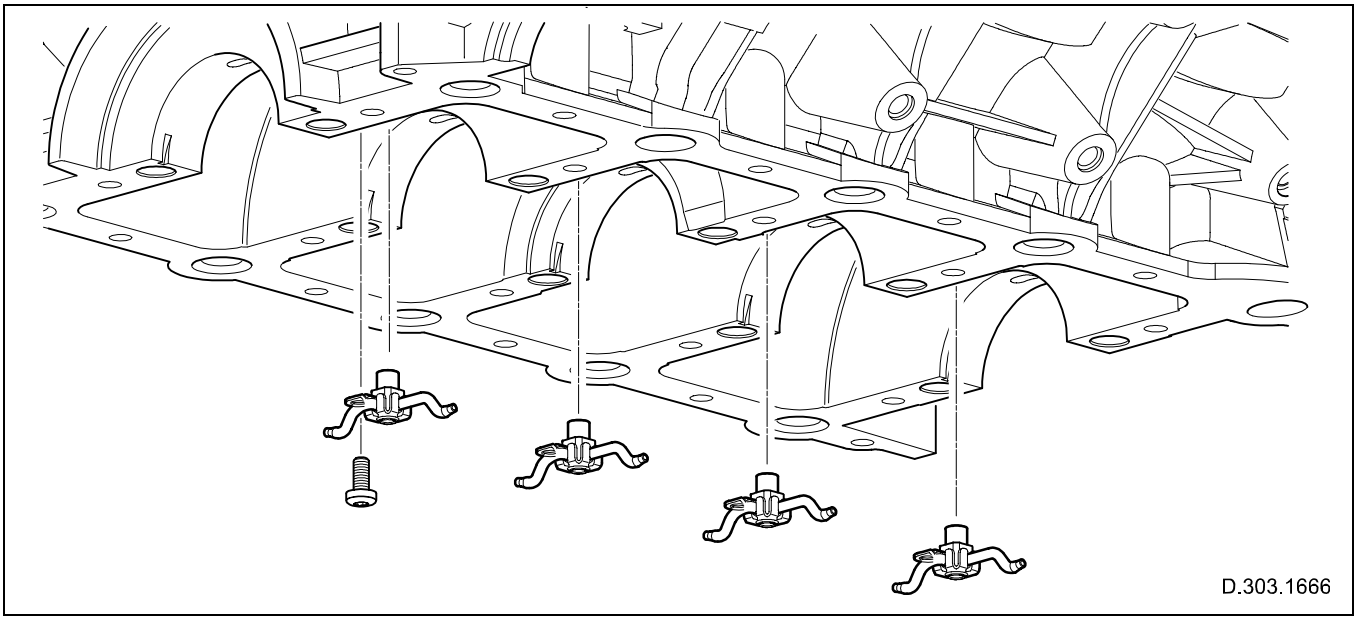


Fig. 33 Piston cooling jets - supercharged engine only

Connecting Rods

Connecting rods are sinter forged and fractured split. The small-end bearings have a 'Y' style oil groove for optimized bearing surface area.

Crankshaft

The crankshaft is supported by five main bearings.

- AJ-V8 4.2-liter engine: the crankshaft stroke has been increased for 4.2-liter displacement. To reflect the stroke increase the crank-pin journal diameter has been reduced to accommodate the revised stroke within existing cylinder block constraints.
- AJ-V8 3.5-liter engine: the crankshaft stroke has been reduced for 3.5-liter displacement. To reflect the stroke reduction and to allow for the use of a shared cylinder block with the 4.2-liter engine, the connecting rods have been lengthened to maintain the required compression ratio.

Primary Chain

A new primary chain, with a reduced-pitch and inverted-tooth design reduces loading and radiated noise levels. The chain's associated sprockets are also modified to accommodate the new chain design.

In addition, the crankshaft's primary-chain sprocket is now a one-piece unit located on the crankshaft by a woodruff key. A torsional-vibration-damper with revised vibration tuning retains the sprocket in position.

Lubrication of the primary chain and crankshaft sprockets is via two squirt-jets directly mounted to the oil pump.

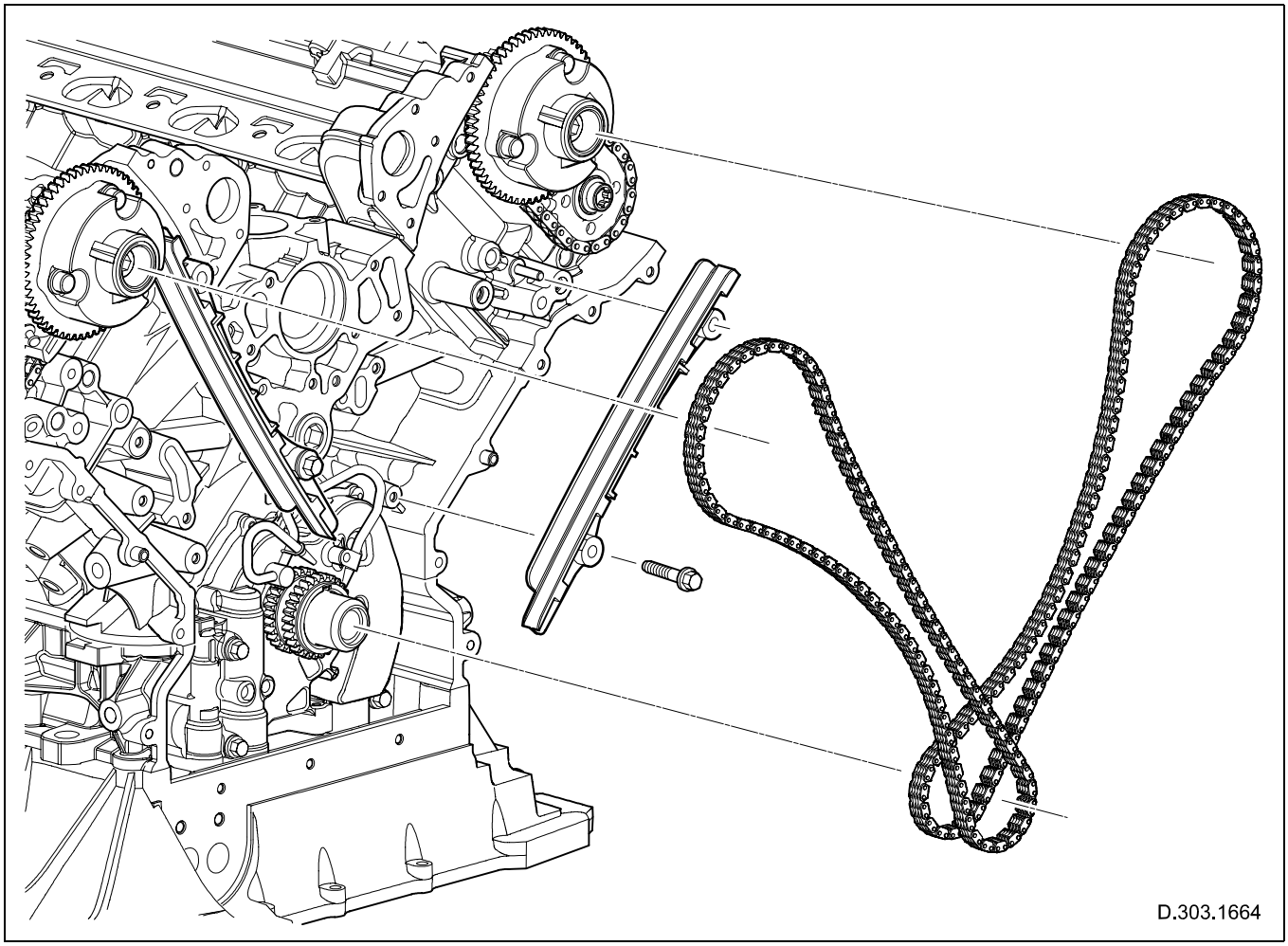


Fig. 34 Primary chain

Fuel Injectors

New multi-hole injector's supply improved spray performance and targeting within the combustion chamber, enabling the engine to extract the full-energy potential from every droplet of fuel. This acts to boost engine performance and improve fuel economy, without the additional components of air-assist injection.

Engine Lubrication

An upgraded lubrication system, mainly to provide improved variable valve timing (VVT) response on normally aspirated engines is introduced. The pumping element is an eccentric rotor, directly driven by the crankshaft. The oil inlet of the pump is through a directly mounted pick-up pipe; the outlet port aligns with the oil passage in the engine's bedplate. An integral pressure relief valve regulates pump pressure at 4.7 bar.

Two squirt-jets directly mounted to the pump provide lubrication to the primary chain. An over-pressure valve incorporated within the pump protects the engine components during cold starts.

Supercharged variants incorporate a thermostatically controlled oil-diverter valve, installed in the pump's outlet passage, to divert the oil through to the engine's oil cooler at high engine temperatures.

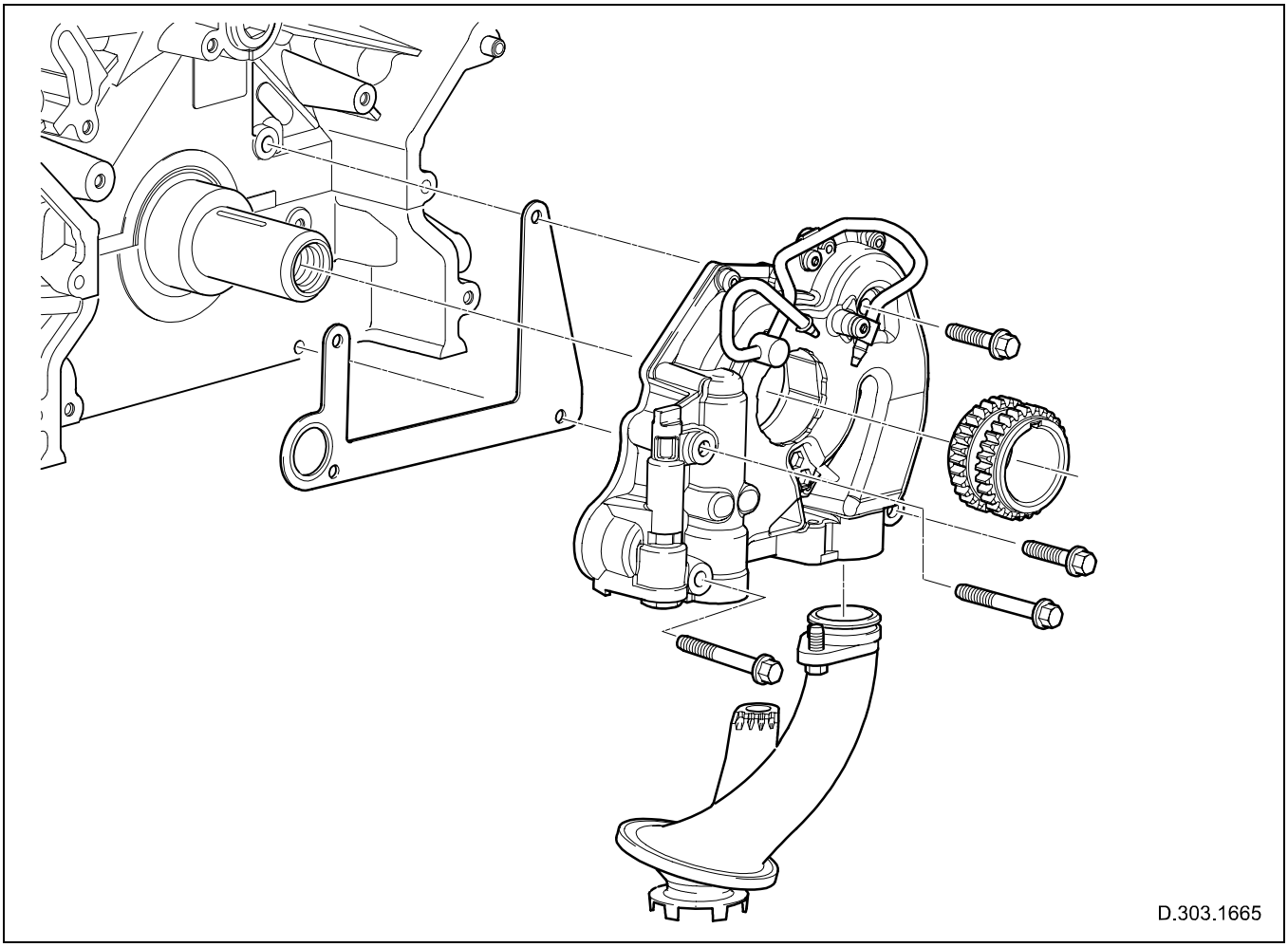


Fig. 35 Oil pump

Exhaust Manifold

The exhaust manifolds are now manufactured from cast stainless steel. On the normally aspirated engine, the manifolds are branched, providing a tuning effect that increases torque at low engine speed. The exhaust manifold on the supercharged engine remains as the conventional 'log' design.

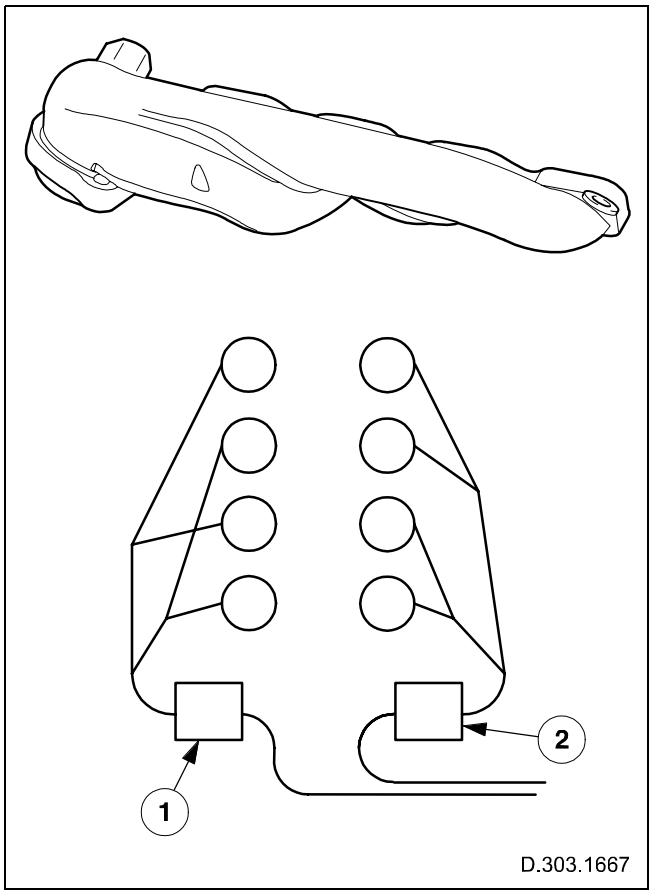


Fig. 36 Branched exhaust manifold - normally aspirated engines only

1. Catalytic converter left-hand
2. Catalytic converter right-hand

Variable Valve Timing (normally aspirated engine)

The continuous variable valve timing (VVT) on the normally aspirated engine continues the theme of improved low and high-speed engine performance and excellent idle quality.

To optimize engine performance, the valve timing on the 4.2-liter and 3.5 liter engines is specially tuned to reflect the size of the engine.

The VVT system changes the phasing of the intake valves, relative to the fixed timing of the exhaust valves, to alter:

- the mass of air-flow into the engine's cylinders,
- and the engine's torque response and emissions.

Although the principle function of this VVT system is the same as that used on the V8 (AJ-27) engine, the internal operating components of this VVT unit are different. Instead of a helical gear construction, this VVT unit uses a vane device to control the camshaft angle, refer to **VVT Operation**. The system operates over a range of 48 degrees and is advanced or retarded to the optimum angle within this range.

The engine control module (ECM) controls the VVT, using engine control signals pertaining to engine speed and load, and engine oil temperature to calculate the appropriate camshaft position.

The continuous VVT system provides the following advantages:

- Reduces engine emissions and fuel consumption by further optimizing the camshaft timing, this improves the engine's internal exhaust gas recirculation (EGR) effect over a wider operating range.
- Improves full-load torque characteristics as the camshaft timing is optimized at all engine speeds for superior volumetric efficiency.
- Improves fuel economy by optimizing torque over the engine's speed range.

This system also has the added benefits of operating at a lower oil-pressure and faster response time.

VVT Operation

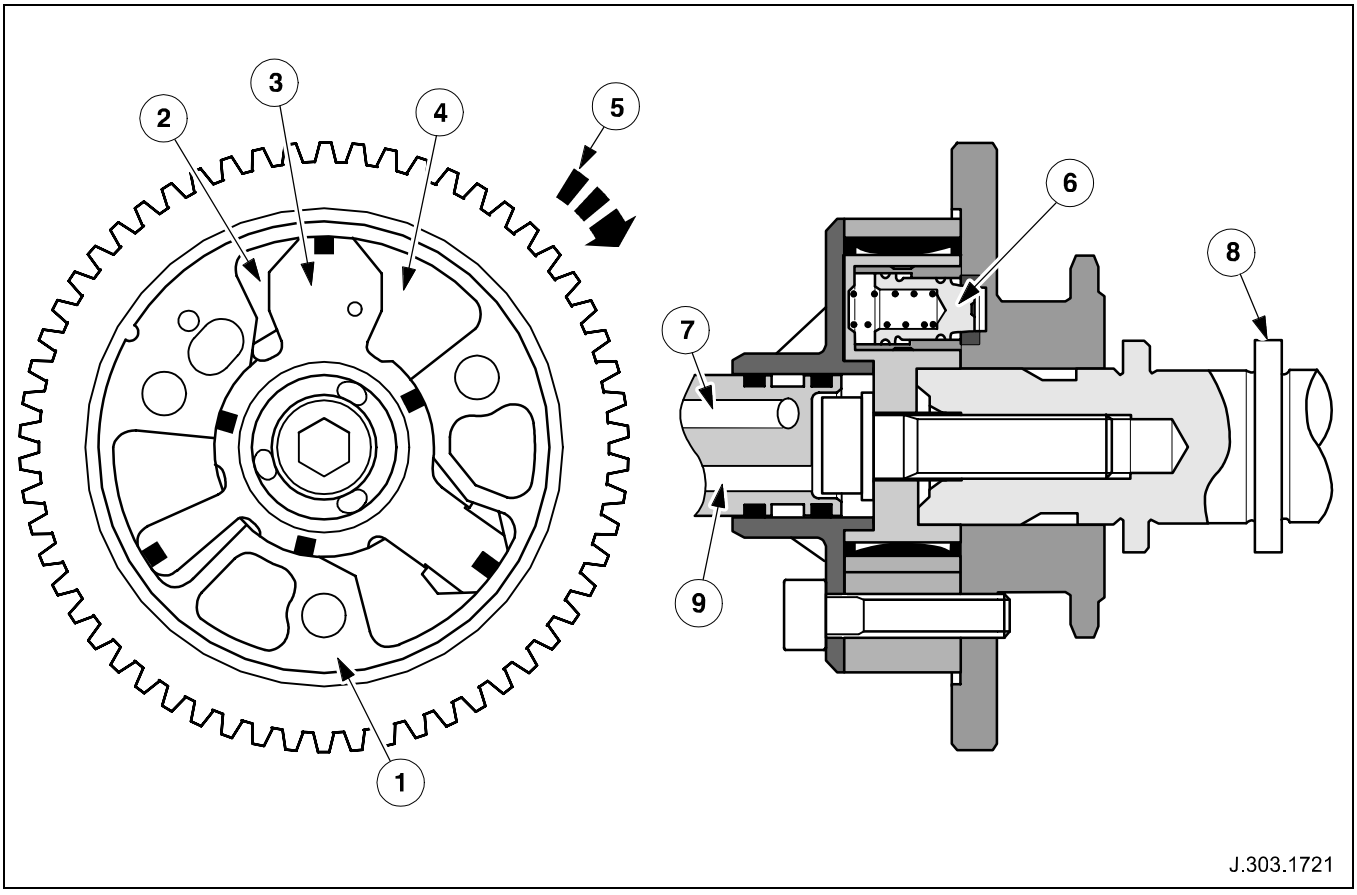


Fig. 37 VVT unit

1. Vane housing
2. Advance chamber
3. Vane shaft
4. Retard chamber
5. Rotation direction
6. Stopper pin
7. Advance chamber oil-channel
8. Intake camshaft
9. Retard chamber oil-channel

The VVT unit is a hydraulic actuator mounted on the end of the intake camshaft, which advances or retards the intake camshaft timing and thereby alters the camshaft to crankshaft phasing. The oil control solenoid, controlled by the ECM, routes oil pressure to either the advance or retard chambers located either side of the three vanes interspersed within the machined housing of the unit.

The VVT unit is driven by the primary chain and rotates relative to the exhaust camshaft sprocket. When the ECM requests the camshaft timing to advance, the oil control solenoid is energized moving the shuttle valve to the relevant position to allow engine oil pressure, via a filter, into the VVT unit's advance chambers. When the camshaft timing is requested to retard, the shuttle valve moves position to allow oil pressure to exit the advance chambers, while simultaneously routing the oil pressure into the retard chambers.

When directed by the ECM, the VVT unit will be set to the optimum position between full advance and retard for a particular engine speed and load. This is achieved by the ECM sending the energizing signal to the oil control solenoid until the target position is met. At this point, the energizing signal is reduced to hold the solenoid position, and as a result the position of the shuttle valve. This function is under closed-loop control, where the ECM will assess any decrease in shuttle-valve oil-pressure, via signals from the camshaft position sensor. The ECM will increase the energizing signal, when required, to maintain the shuttle-valve hold position.

Engine oil properties and temperature can affect the ability of the VVT mechanism to follow demand changes to the cam phase angle. At very low oil-temperatures, movement of the VVT mechanism is sluggish due to increased viscosity, and at high oil-temperatures the reduced viscosity may impair operation if the oil pressure is too low. To maintain satisfactory VVT performance, an increased capacity oil pump is installed, plus an engine oil temperature sensor to enable monitoring by the ECM. The VVT system is normally under closed-loop control except in extreme temperature conditions, such as cold starts below 0° Celsius. At extremely high oil-temperatures, the ECM may limit the amount of VVT advance to prevent the engine from stalling when returning to idle speed.

The VVT does not operate when engine oil-pressure is below 1.25 bar, as there is insufficient pressure to release the VVT unit's internal stopper pin. This usually occurs when the engine is shutting-down and the VVT has returned to the retarded position. The stopper pin locks the camshaft to the VVT unit to ensure camshaft stability during the next engine start-up.

Engine Cooling

Cooling Pack Assembly

The cooling pack assembly is common to all derivatives and comprises:

- Radiator.
- Cooling fan (incorporating brushless motor with integral speed controller).
- Condenser (with integral receiver-drier).
- Transmission fluid cooler (integral to the radiator end-tank); refer to **Automatic Transmission**.

NOTE: The coolant drain-plug is located beneath the radiator end-tank.

The coolant expansion tank has an integral bleed screw and coolant-level sensor.

The auxiliary coolant-flow pump is fitted as standard, except for vehicles installed with the V6 engine and 2-zone climate control.

Vehicles fitted with the V8 supercharged (SC) engine have the following additional components:

- Coolant pump (SC).
- Radiator (SC).
- Oil cooler (SC).

The cooling-fan speed is controlled directly by the engine control module (ECM) based on input data measured by the engine coolant temperature sensor, the climate control pressure-transducer and the transmission oil temperature sensor. The ECM processes this input data and outputs a pulse width modulated signal which determines the fan speed. Should the output signal fall outside predetermined parameters, to protect the engine, maximum fan-speed is initiated. High engine temperature is indicated by the illumination of the engine over-temperature warning light, located on the instrument cluster.

Where appropriate, to provide an extended period of engine cooling, the ECM continues to control the fan speed after the ignition has been turned off.

NOTE: Airflow seals located around the edge of the radiator have a significant effect on performance of the cooling and air conditioning systems by preventing uncontrolled air from entering the assembly.

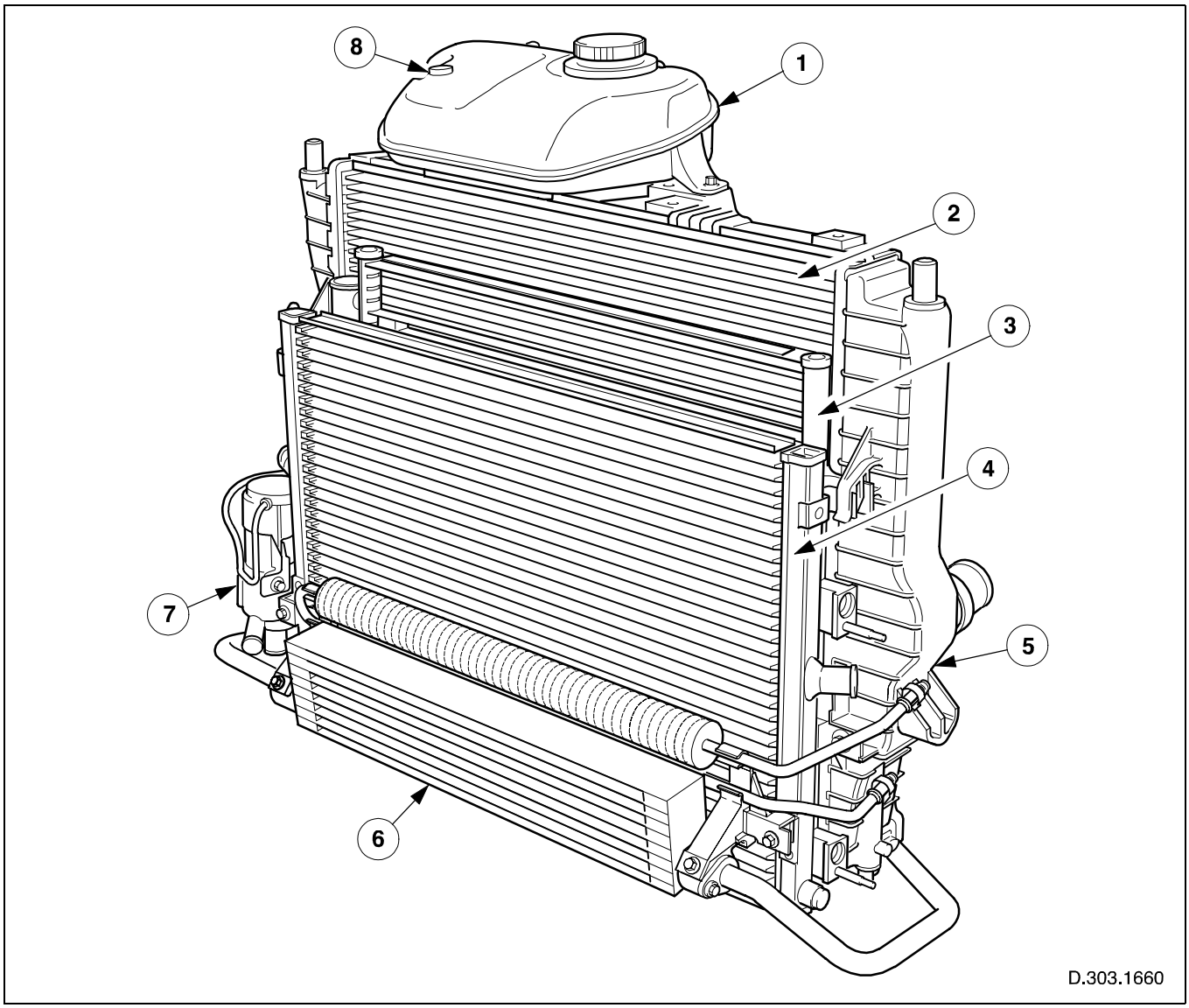


Fig. 38 Cooling pack (SC)

1. Coolant expansion tank
2. Radiator
3. Condenser/receiver-drier
4. Radiator (SC)
5. Radiator end-tank
6. Oil cooler (SC)
7. Coolant pump (SC)
8. Bleed screw

Cooling System (V6)

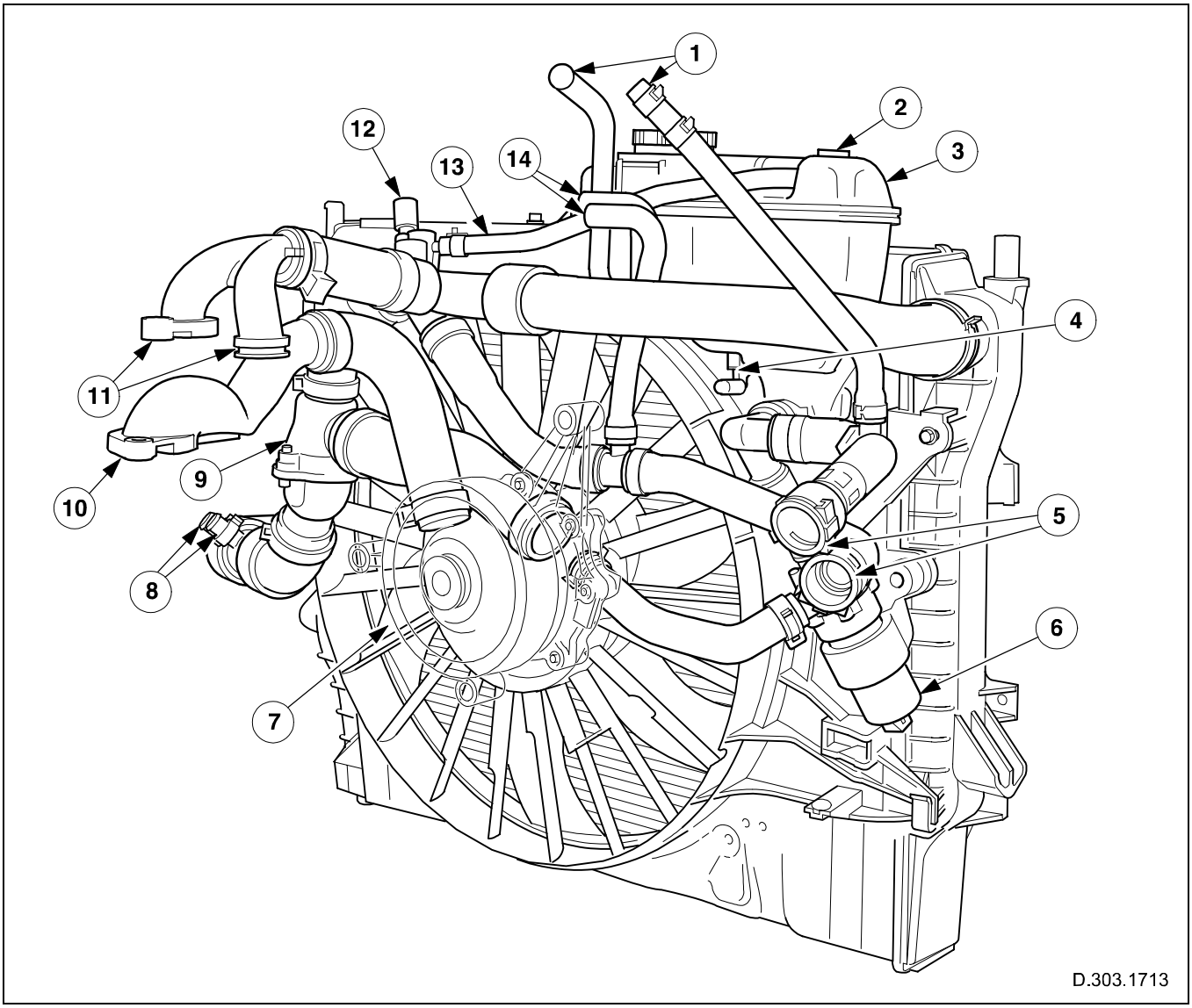


Fig. 39 V6 cooling system components and connections (4-zone climate control variant)

1. Throttle body connections (air intake manifold side)
2. Bleed screw
3. Coolant expansion tank
4. Coolant level sensor
5. Heater hose connections
6. Auxiliary coolant-flow pump
7. Coolant pump
8. Engine oil-cooler connections
9. Thermostat housing
10. Engine coolant inlet
11. Engine coolant outlet
12. Engine coolant temperature sensor
13. Vent hose
14. Throttle body connections

Coolant Flow (V6)

The diagram below shows the coolant flow at normal running temperature (thermostat open).

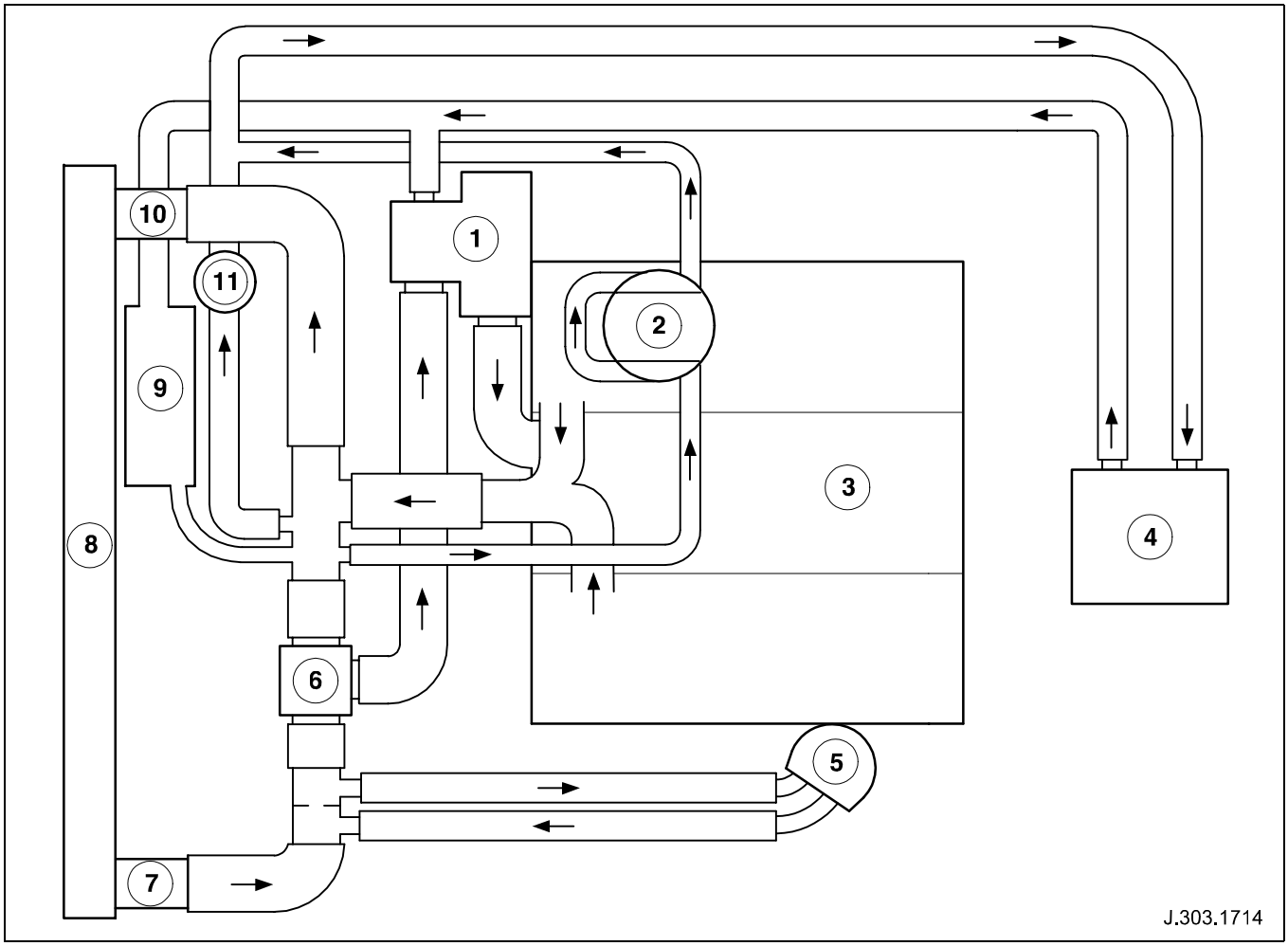


Fig. 40 V6 coolant-flow diagram (4-zone climate control variant)

1. Coolant pump
2. Throttle body
3. V6 engine
4. Heater core
5. Engine oil cooler
6. Thermostat
7. Bottom hose
8. Radiator
9. Coolant expansion tank
10. Top hose
11. Auxiliary coolant-flow pump

Cooling System (V8)

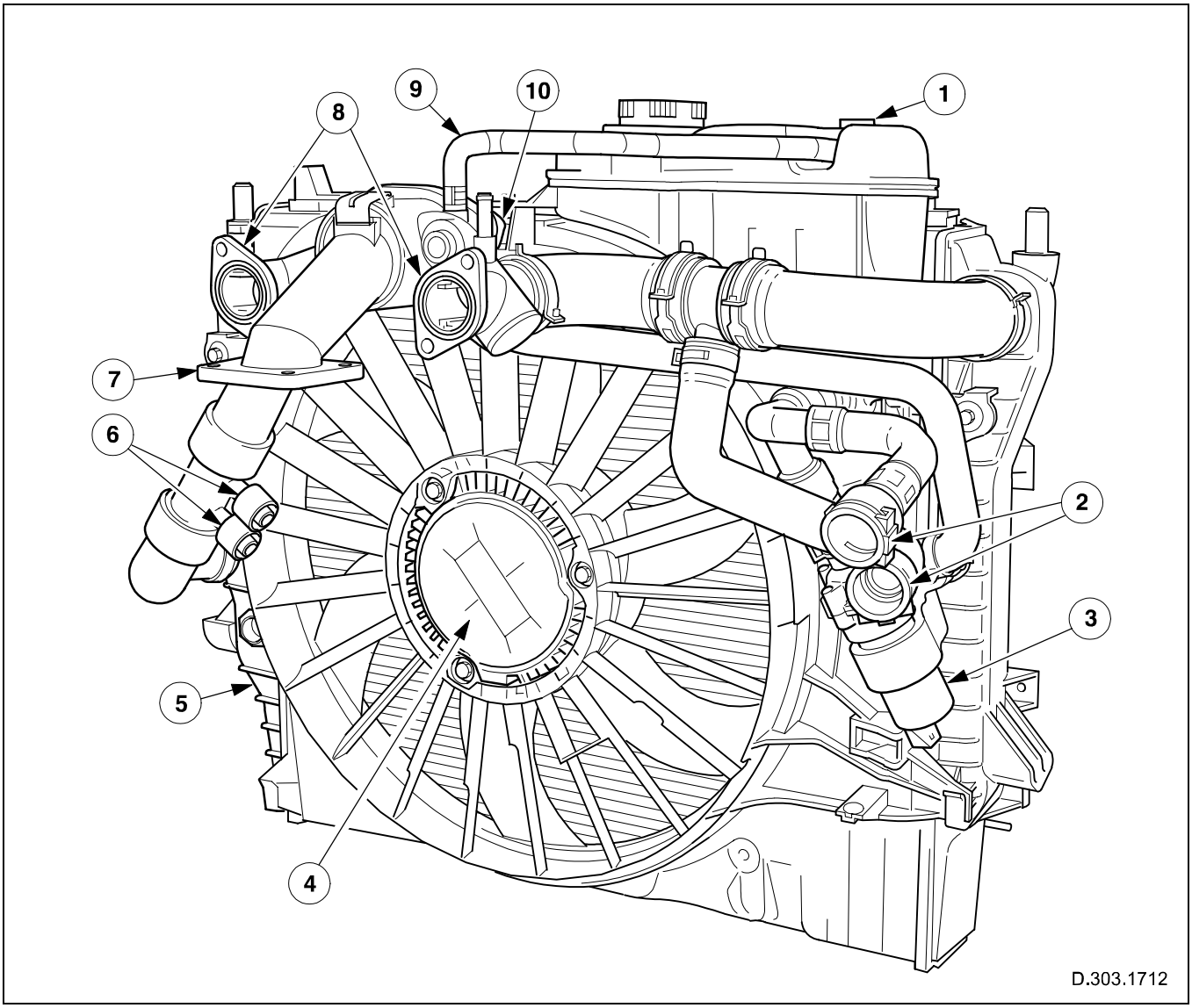


Fig. 41 V8 cooling system components and connections

1. Bleed screw
2. Heater hose connections
3. Auxiliary coolant-flow pump
4. Cooling fan motor
5. Radiator end-tank
6. Engine oil-cooler connections
7. Engine coolant inlet
8. Engine coolant outlet
9. Vent hose
10. Thermostat housing

Coolant Flow (V8)

The diagram below shows the coolant flow at normal running temperature (thermostat open).

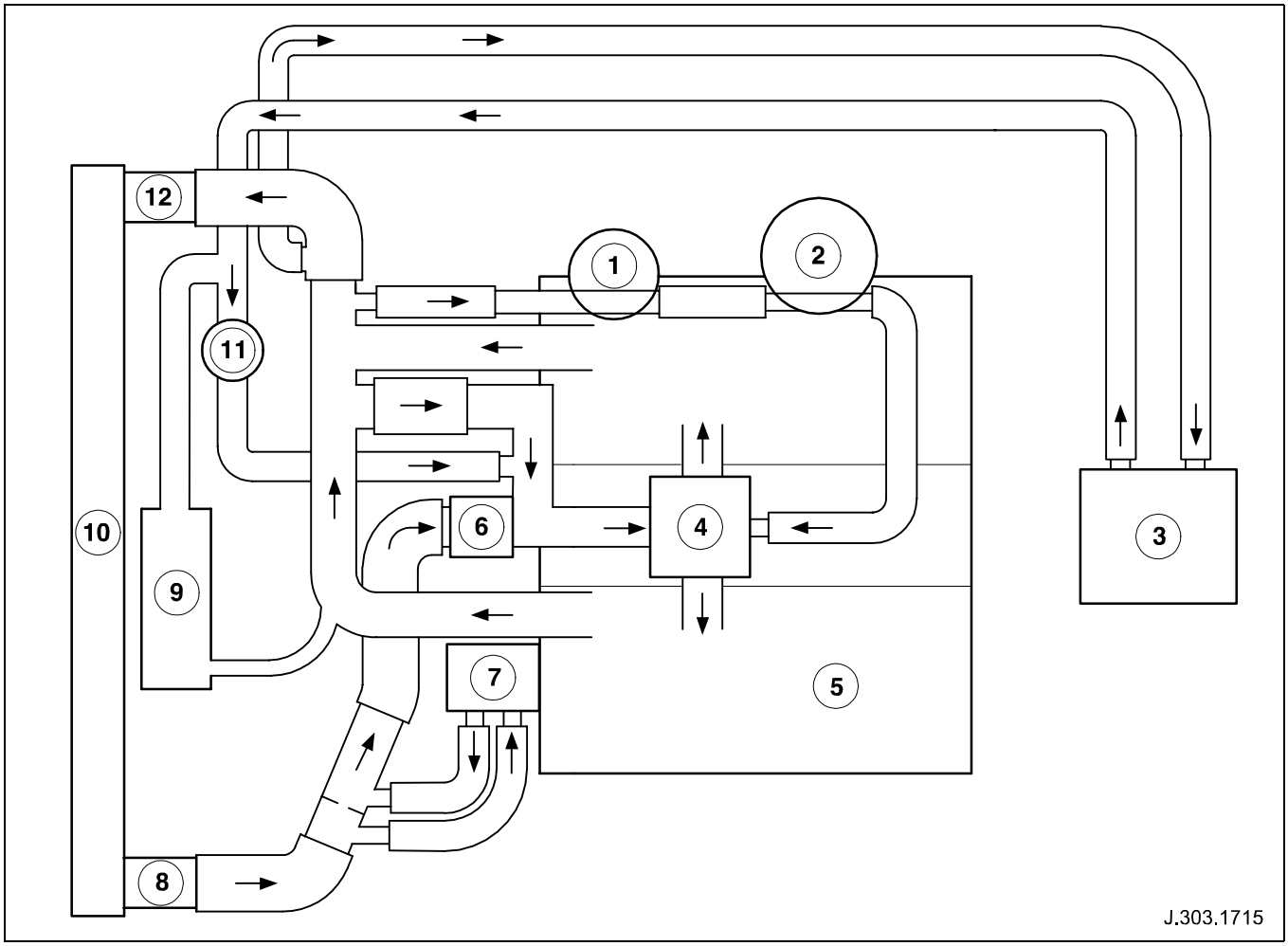


Fig. 42 V8 coolant-flow diagram

1. EGR valve
2. Throttle body
3. Heater core
4. Coolant pump
5. V8 engine
6. Thermostat
7. Engine oil cooler
8. Bottom hose
9. Coolant expansion tank
10. Radiator
11. Auxiliary coolant-flow pump
12. Top hose

Cooling System (V8 SC)

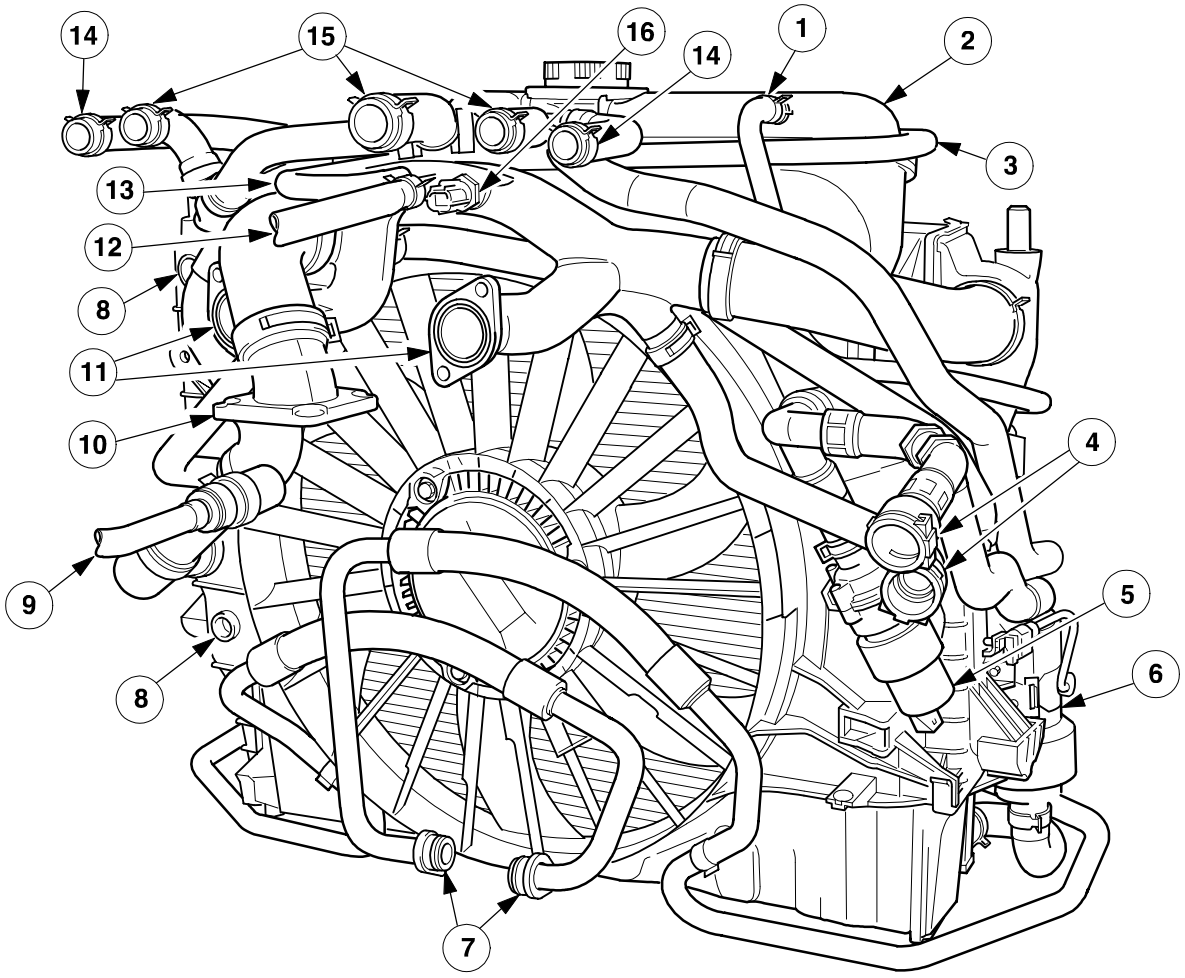


Fig. 43 V8 SC cooling system components and connections

1. Vent hose (SC radiator)
2. Coolant expansion tank
3. Vent hose (radiator)
4. Heater hose connections
5. Auxiliary coolant-flow pump
6. Supercharger coolant-pump
7. Engine oil-cooler connections
8. Transmission oil-cooler connection
9. Throttle-body return hose
10. Engine coolant inlet
11. Engine coolant outlet
12. EGR coolant inlet hose
13. Thermostat housing
14. Charge air cooler return hoses
15. Charge air cooler feed hoses
16. Engine coolant temperature sensor

Coolant Flow (V8 SC)

The diagram below shows the coolant flow at normal running temperature (thermostat open).

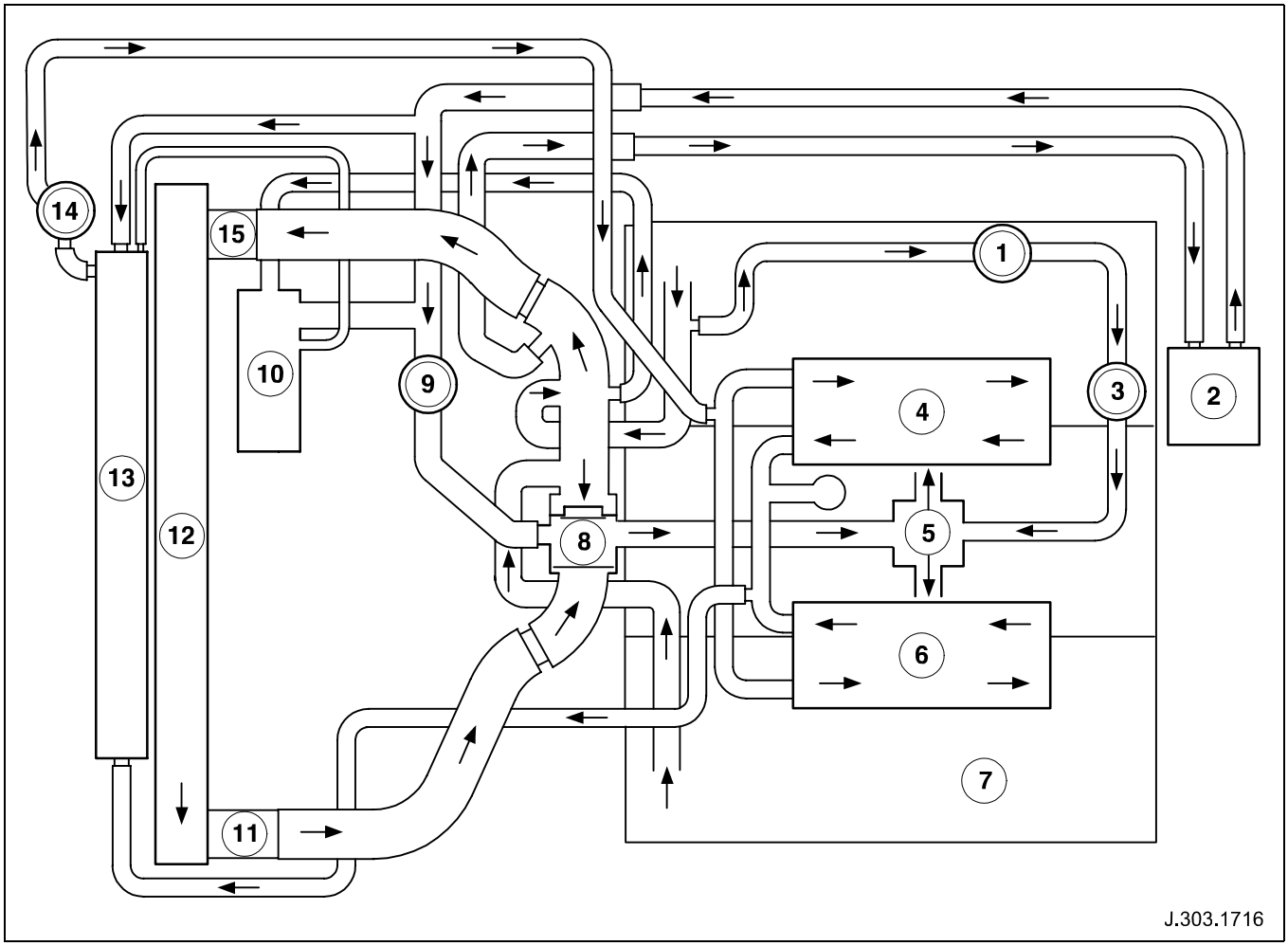


Fig. 44 V8 SC coolant-flow diagram

1. EGR valve
2. Heater core
3. Throttle body
4. Charge air cooler (bank 1)
5. Coolant pump
6. Charge air cooler (bank 2)
7. V8 SC engine
8. Thermostat
9. Auxiliary coolant-flow pump
10. Coolant expansion tank
11. Bottom hose
12. Radiator
13. SC Radiator
14. SC coolant pump
15. Top hose

Fuel Charging and Controls

Electronic Throttle Control

An electronic throttle control is installed, requiring no mechanical connection between the accelerator pedal and throttle body. As the driver operates the accelerator pedal, the accelerator-pedal position sensor on the pedal shaft converts the mechanical rotation to electrical signals. These signals are used by the engine control module (ECM) to analyze driver demand. Driver demand signals in conjunction with other engine control signals are processed by the ECM to provide the engine with the required charge of fuel and air. For further information refer to **Electronic Engine Controls**.

Fuel and Air Charging

Fuel Charging

The fuel pump module(s) controls the amount of fuel supplied by the fuel pump(s) to the fuel rail. This is achieved by the ECM receiving signals from the:

- fuel pressure sensor,
- engine fuel temperature sensor,
- plus driver demand and other engine control signals, to indicate the fuel pressure in the fuel rail.

In response to these signals, the ECM calculates the amount of fuel required by the engine at any given moment and requests the fuel pump module(s) to vary the fuel pump(s) delivery. Refer to **Fuel Tank and Lines** for more information on the returnless fuel delivery system.

Fuel injectors

The ECM controls one injector per-cylinder in sequential order. The timing of the injector firing during normal running conditions is optimized to give the best compromise between emissions and engine performance. The mass of fuel required per injection is derived from a calculation held in the ECM to match the metered mass airflow from the intake manifold. Refer to **Electronic Engine Controls** for more information on fuel injection.

NOTE: New multi-hole injectors are introduced, supplying improved spray performance and targeting within the combustion chamber, enabling the engine to extract the full-energy potential from every droplet of fuel. This type of injector helps to boost engine performance and improve fuel economy, without the additional components of air-assist injection.

Air Charging

Throttle Body

The throttle body houses the throttle disc, which governs the volume of air entering the intake manifold. The throttle motor controls the position of the throttle disc, via driver demand and engine control signals provided by the ECM. The actual angle of the throttle disc is indicated to the ECM by the throttle position sensor, which works in conjunction with the throttle motor to provide closed loop control of the throttle body.

V6 Normally Aspirated

A reduced volume three-stage variable-geometry upper intake-manifold is introduced into the XJ Range with identical concept and operating parameters as the intake manifold used on the S-TYPE and X-TYPE V6 engines.

The intake manifold; refer to **Fig. 46**, is designed to improve response rates and optimize torque across the engine speed and load range. The air-charge enters the intake manifold from the throttle body and passes through a plenum chamber for distribution to the cylinders. The function of the plenum chamber is to provide a resonance (or maximizing) effect so that large pulses of charge-air will arrive at the inlet ports at the correct time for induction into the cylinders. This ram charging action is only effective over a restricted speed and load range for a particular plenum chamber volume and geometry. To extend the effect over the whole engine speed range, this type of manifold can set the geometry to three different configurations. This is achieved by the ECM, individually switching the intake manifold tuning valves (IMT valves) between fully open and fully closed at calibrated engine speeds. Each of these configurations modifies the geometry of the manifold plenum chamber, maximizing the tuning effect over different parts of the engine range. The resulting optimized volumetric efficiency provides optimized engine torque output throughout the engine's entire speed range. Optimized plenum volume also acts to improve transient response where required.

V8 Normally Aspirated

The air-intake manifold on the 3.5 liter and 4.2 liter normally aspirated engines; refer to **Fig. 47**, operates on the same concept as the previous 4.0 liter system.

The very smooth inner walls of the injection molded manifold offer minimum air flow restriction. This, combined with low thermal conductivity of the nylon manifold, helps improve engine performance by as much as 1% to 2% over that of an aluminum manifold. The low thermal conductivity of the nylon manifold also helps improve engine performance. The nylon manifold insulates the air inside it from engine heat, and thus allows high-density intake air to flow into the engine.

V8 Supercharged

The introduction of the 4.2 liter supercharged engine, also introduces a revised air intake system and supercharger unit into the XJ Range; refer to **Fig. 45** and **Fig. 48**. The modifications as listed below, enhance engine performance by either improving intake airflow or increasing supercharger speed by 5%.

- Supercharger rotors driven by helical-cut gears in place of spur-cut gears.
- Supercharger rotors have a more efficient coating to improve airflow.
- A more efficient air-intake trunking to improve airflow.
- Low loss supercharger outlet ducts.
- Twin air-intake into the air cleaner housing.
  - The ECM directly controls the solenoid; refer to **Fig. 45**, to open and close the air intake control-flap in the air-cleaner housing. The control flap is opened at high engine speeds and loads to satisfy engine air-charge requirements.
- High-density fin intercoolers also provide improved supercharger cooling efficiency.

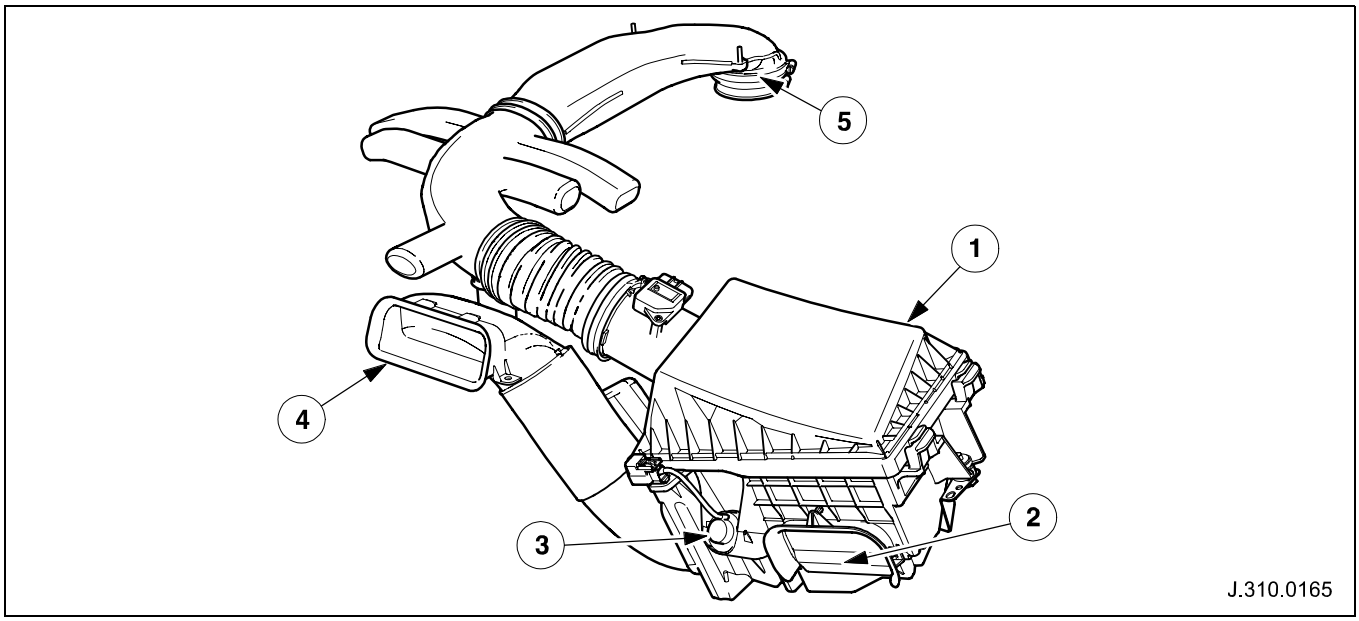


Fig. 45 V8 supercharged air-intake assembly

1. Air cleaner housing
2. Control flap
3. Control flap solenoid
4. Air intake
5. Air outlet to throttle body

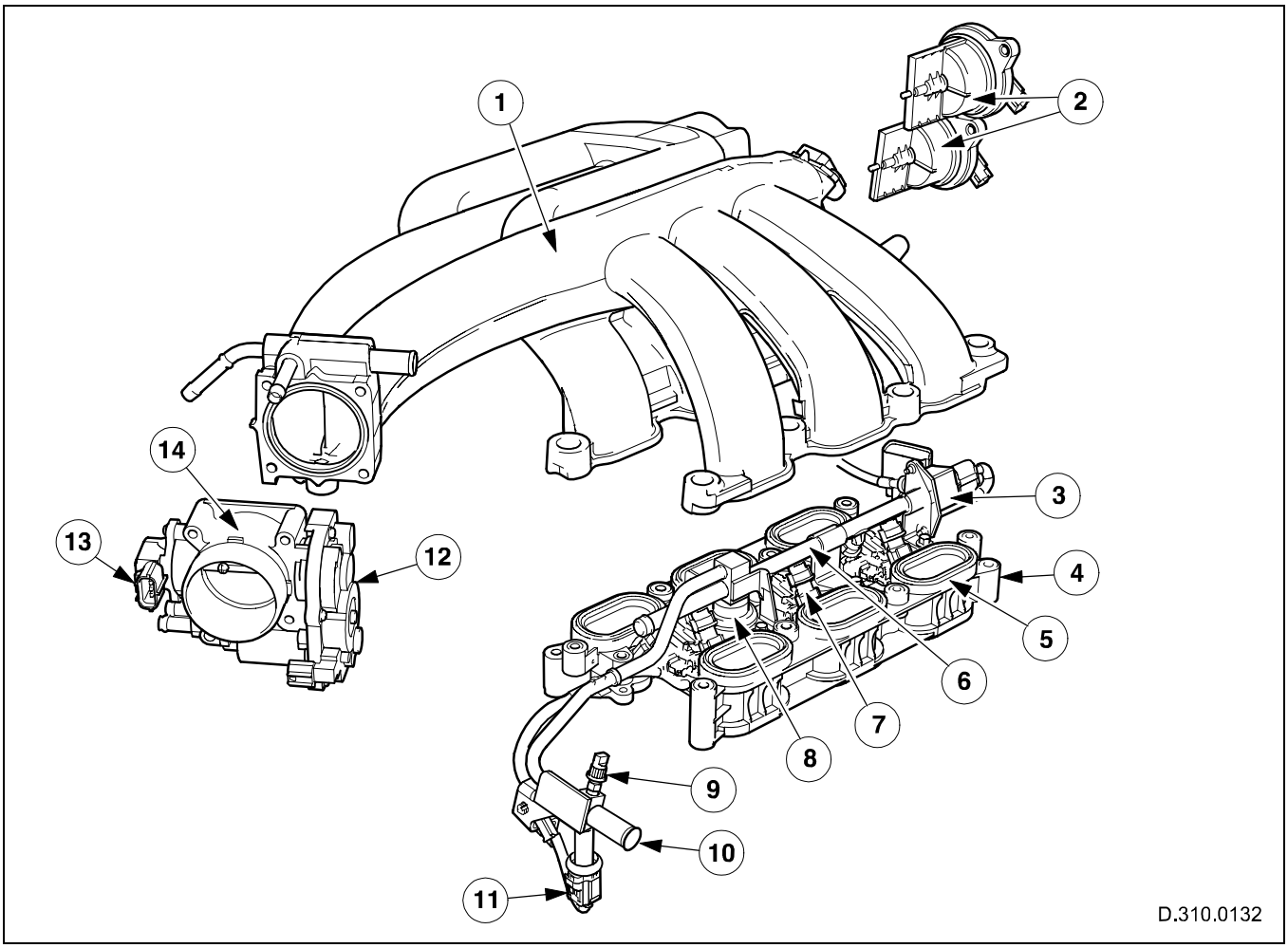


Fig. 46 Fuel charging system - V6 normally aspirated

1. Intake manifold
2. Intake manifold tuning valves
3. Fuel pressure sensor
4. Lower intake manifold
5. Gasket
6. Fuel rail
7. Injector
8. Fuel pulse damper
9. Depressurization valve
10. Fuel supply
11. Engine fuel temperature sensor
12. Throttle motor
13. Throttle position sensor
14. Throttle body

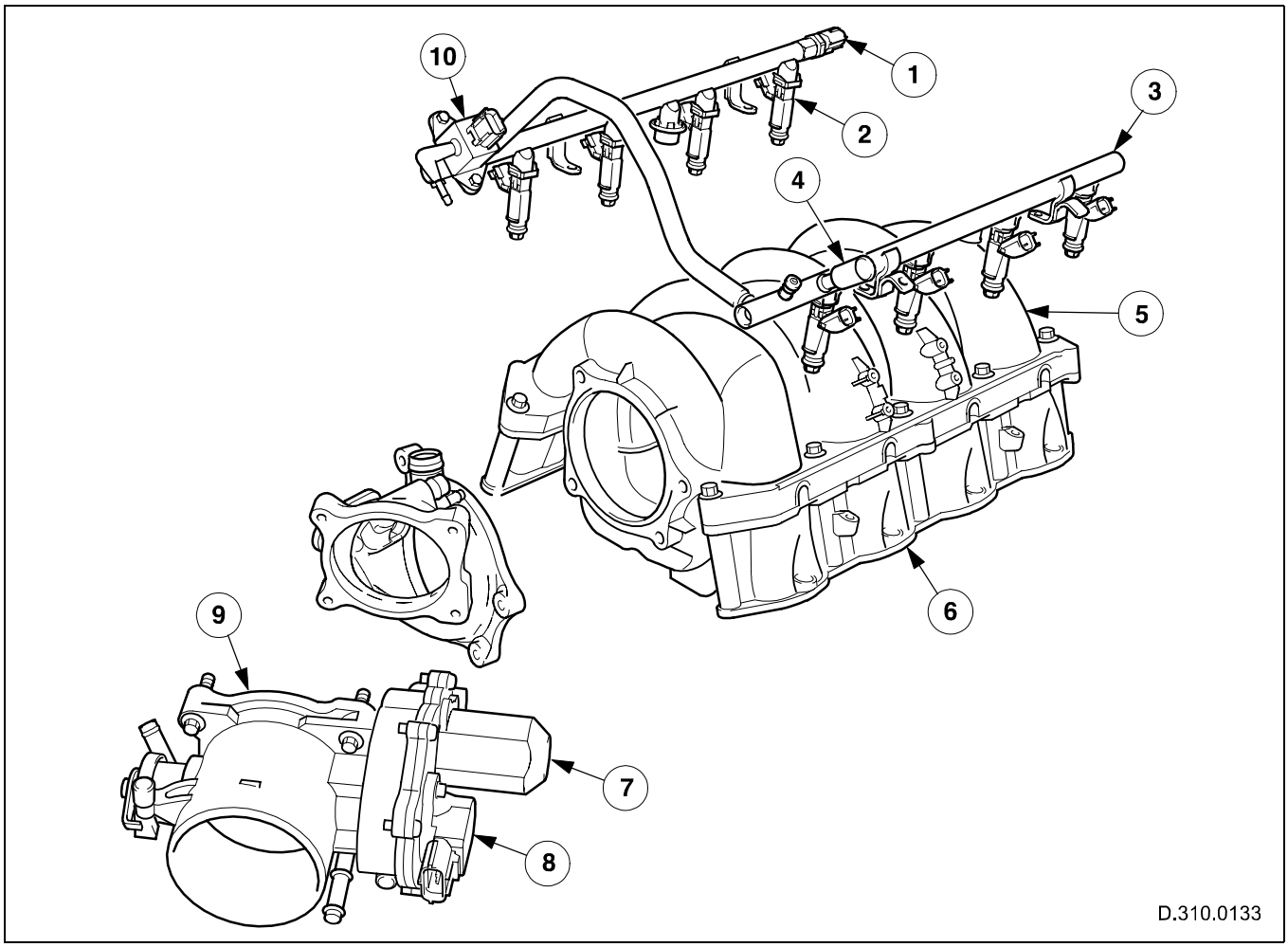


Fig. 47 Fuel charging system — V8 normally aspirated

1. Engine fuel temperature sensor
2. Injector
3. Fuel rail
4. Fuel supply
5. Intake manifold
6. Lower intake manifold
7. Throttle motor
8. Throttle position sensor
9. Throttle body
10. Fuel pressure sensor

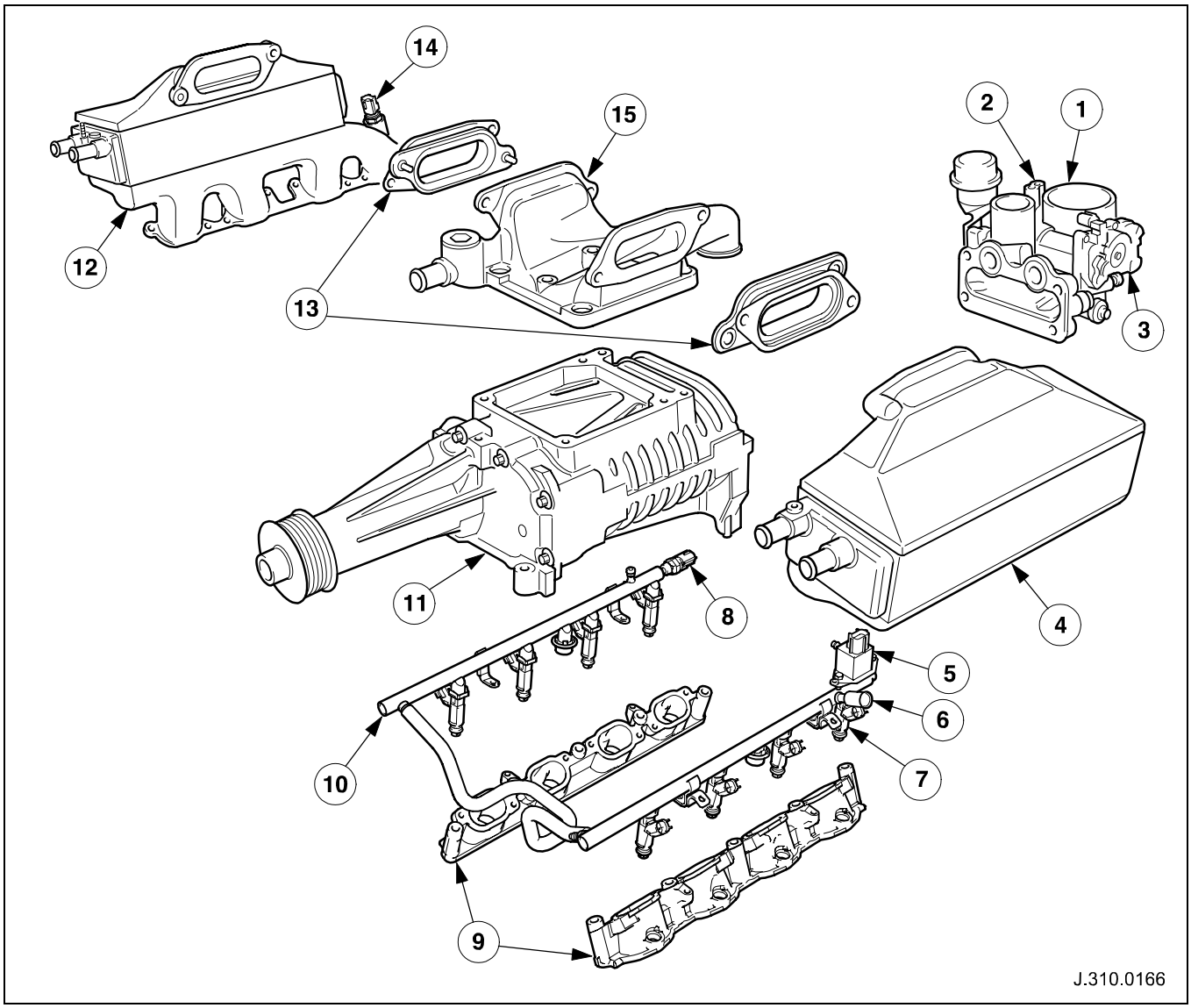


Fig. 48 Fuel charging system — V8 supercharged

1. Throttle body
2. Throttle position sensor
3. Throttle motor
4. Charge air cooler and intake manifold
5. Fuel pressure sensor
6. Fuel supply
7. Injector
8. Engine fuel temperature sensor
9. Fuel rail adaptors
10. Fuel rail
11. Supercharger
12. Charge air cooler and intake manifold
13. Cool-air engine charge duct
14. Air temperature sensor
15. Supercharger outlet duct

Evaporative Emissions

On-board Refueling Vapor Recovery

To meet on-board refueling vapor recovery (ORVR) requirements, the fuel tank and associated components are designed to minimize fuel vapor loss, by preventing fuel vapor from the fuel tank venting directly to the atmosphere. Fuel vapor therefore, is vented into the evaporative emission canister (EVAP canister) where it is stored before being purged at intervals to the engine's inlet manifold.

During refueling the narrow fuel-filler-tube below the fuel-dispenser nozzle region, provides a liquid seal against the escape of vapor. A check valve also located in the filler-tube opens to incoming fuel to prevent splash back. As the fuel tank fills, fuel vapor is routed through the open float-level vent-valve located in the top of the tank. Then through to the EVAP canister where hydrocarbons are removed from the vapor to meet emission regulations. The purified air passes to atmosphere through the vent pipe; refer to **Evaporative Emission Canister**. The remaining hydrocarbons are stored in the EVAP canister, where at intervals they are purged into the engine for combustion; refer to **Evaporative Emission Canister Purge Valve**.

The rising fuel-level in the fuel tank closes the float-level vent-valve when the fuel tank reaches full, and the resulting backpressure causes refueling to stop automatically. While the float-level vent valve is closed, any further rise in vapor pressure is vented to the EVAP canister via the grade vent-valve.

NOTE: The float-level vent valve is always open when the fuel-tank level is below full, providing an unrestricted vapor outlet to the EVAP canister.

If a malfunction occurs in the fuel tank delivery system and the tank overfills, an integral pressure relief valve in the float-level valve opens, to provide a direct vent to atmosphere.

The ORVR system incorporates the following safety devices:

- The fuel-filler cap incorporates both pressure and vacuum relief valves.
- Both the float-level vent valve and the grade vent valve incorporate protection against leakage in the event of a vehicle rollover.

Evaporative Emission Canister

A new single EVAP canister is introduced, replacing the twin canister system; refer to **Fig. 49**. The canister has a volume of 2.3 liters and is positioned above the fuel tank and mounted to the vehicle's underbody. Owing to the limited storage-volume of the EVAP canister the charcoal filter is continually regenerated. This is achieved when the engine is running, by drawing air through the EVAP canister, via the vent pipe, into the engine for combustion.

An EVAP canister close-valve is attached to the EVAP canister, which when instructed by the ECM seals the vent pipe. At the same time, the purge valve is opened to allow a vacuum from the intake manifold to be created in the fuel system. The purge valve is then closed to allow the ECM to perform fuel-vapor leak-check diagnostics. The ECM monitor's signals received from the fuel tank pressure sensor to measure the rate of increase in fuel tank pressure, to determine if there is a leak within the system.

The dust box acts as a filter to protect the close valve from the ingress of moisture and dust particles.

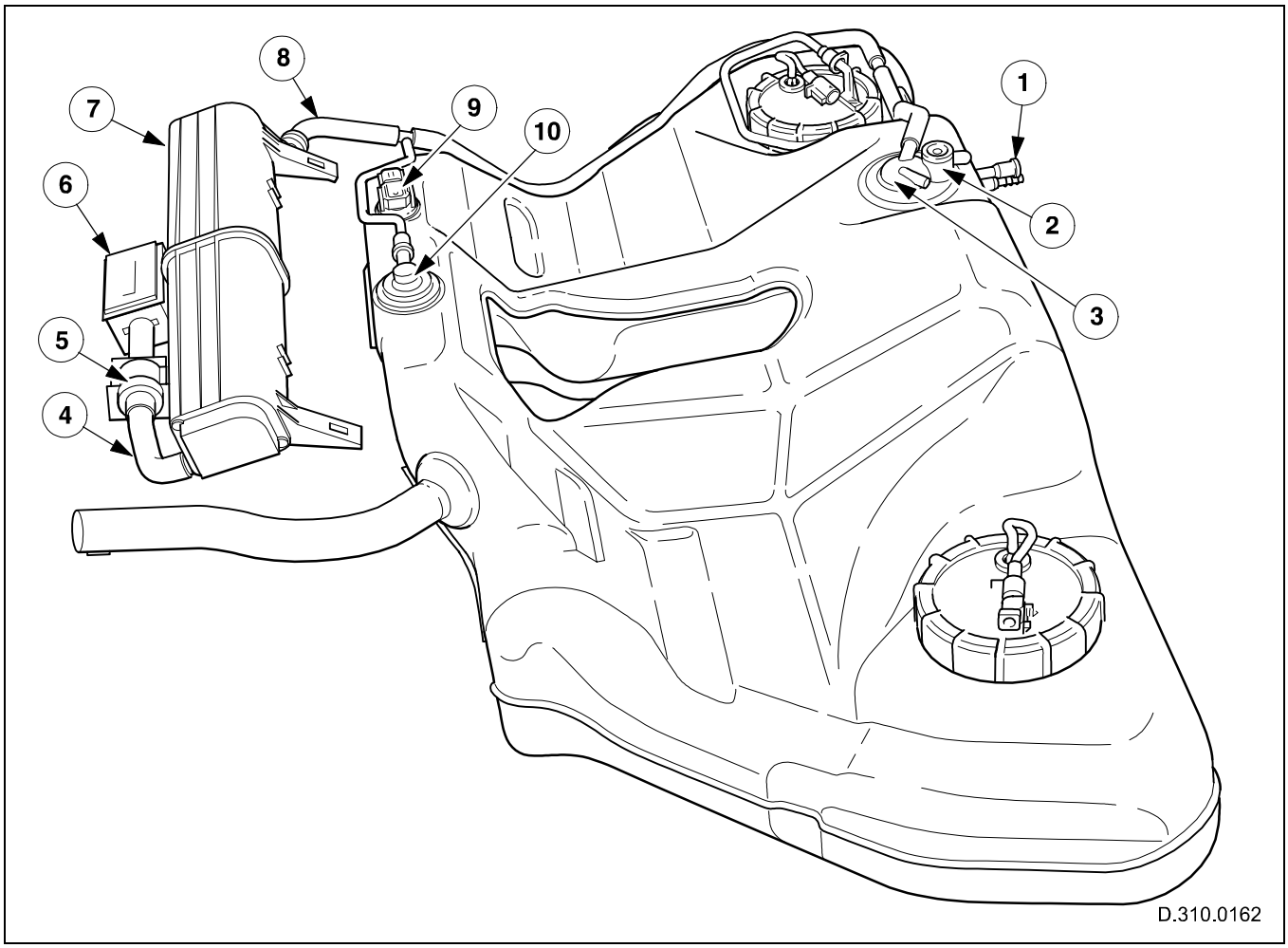


Fig. 49 Evaporative emission system

1. Pipe to EVAP canister purge valve
2. Pressure relief valve
3. Float level valve
4. Vent pipe
5. EVAP canister close valve
6. Dust box
7. EVAP canister
8. EVAP canister, inlet and outlet pipe
9. Fuel tank pressure sensor
10. Grade vent valve

Evaporative Emission Canister Purge Valve

The EVAP canister purge valve is located on the engine compartment bulkhead. The ECM operates the valve to purge fuel vapor from the EVAP canister into the engine for combustion. Purge rates (the extent that the purge valve opens) are determined by the engine operating conditions and the vapor concentration level. The purge rates are adjusted to maintain vehicle, driving characteristics and exhaust emissions at optimum levels.

The engine operating conditions that affect the purge rate are:

- speed and load;
- coolant temperature;
- time from engine start-up;
- closed loop fueling.

To determine the vapor concentration level, the ECM applies stepped opening signals to the purge valve and monitors the subsequent fuelling correction. This is usually performed before purging, so when purging starts, the purge valve can immediately be set to the optimum position. If the ECM is unable to determine the vapor concentration before purging, it uses a default value, which it modifies while purging is in process.

NOTE: A test port, for use in NAS markets only, is provided on the purge valve line to enable leak test diagnosis of the fuel system.

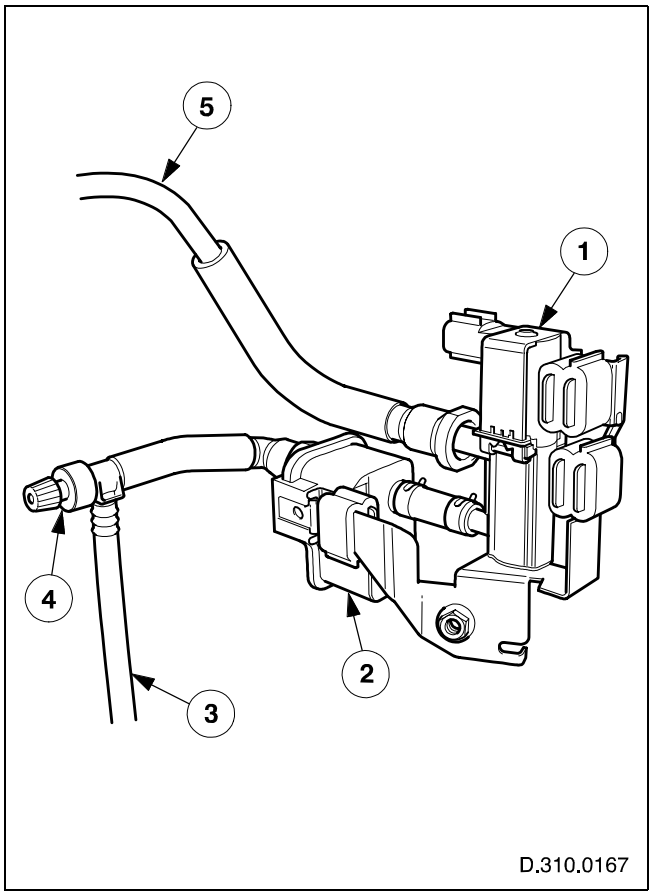


Fig. 50 Evaporative emission canister purge valve

1. Purge valve
2. Reservoir
3. Pipe to fuel tank
4. Test port — NAS function only
5. Pipe to engine

Electronic Engine Controls

Introduction

A new electronic engine control system is introduced into the new XJ, used on both V6 and V8 engines. The system consists of an engine control module (ECM) and a number of sensing and actuating devices. The sensors supply the ECM with input signals, which relate to engine operating conditions and driver requirements. The ECM, using calibrated data-tables and maps, evaluates the sensor information. The ECM then uses the results to command an appropriate response from the actuating devices. The system provides the necessary engine control accuracy and adaptability to:

- minimize exhaust emissions and fuel consumption;
- provide optimum driver control under all conditions;
- minimize evaporative fuel emissions;
- provide system diagnostics when malfunctions occur.

In addition to these functions, the ECM also interfaces with other vehicle systems via the controller area network (CAN).

Engine Control Module

The 32–bit ECM is at the center of the system and provides the overall control. Its functions, each of which is dependent on engine and vehicle state at any moment of time and driver requirements, are listed below:

- Starting: ensures that conditions are safe to crank the engine.
- Engine:
  - controls the rate of air and fuel flow into the cylinders,
  - adjusts the intake manifold volume,
  - controls the ignition and intake camshaft timing.
- Fuel supply: controls the operation of the fuel pump(s) and vapor purge valve.
- Cooling: controls the engine cooling fans.
- Battery: optimizes the battery charging conditions.
- Air conditioning and screen heater: controls the speed of the engine when these additional loads are added, also disables the air conditioning when it is beneficial to reduce the load on the engine.
- Speed control: provides the option to maintain a fixed vehicle speed without driver intervention.
- Robustness: maintains engine-running condition under intermittent or permanent single point failures on any sensors or actuators fitted to the system, and records fault codes of these failures for system diagnosis.
- Diagnosis: notifies the driver when a system malfunction occurs and records data for system diagnosis.

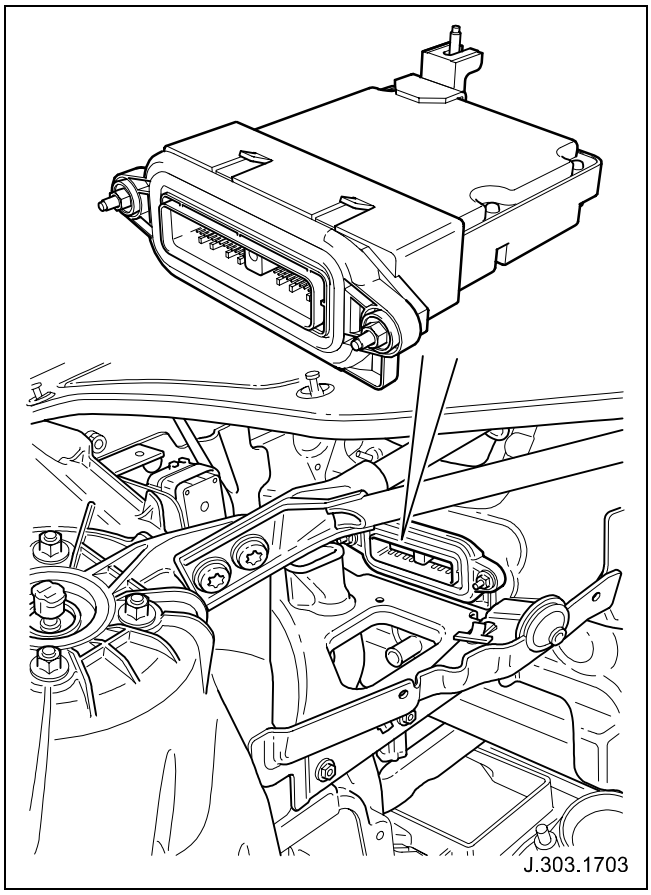


Fig. 51 Engine control module

Electrical Load Management

The electrical load management system used on the XJ is a new concept. The system utilizes the capability of existing vehicle messaging and subsystems, including the ECM, to analyze the overall power supply condition. Using this data the system makes its decision on which electrical features can be supported at any one time, therefore preventing the risk of damaging the battery.

For further information on this system; refer to **Battery and Charging Systems**.

System Interfaces

In the diagram below each rectangular box represents a system with which the ECM interfaces. The arrows represent the data flow between the system and the ECM.

The interface between the various systems and the ECM is discussed in the relevant section of the publication.

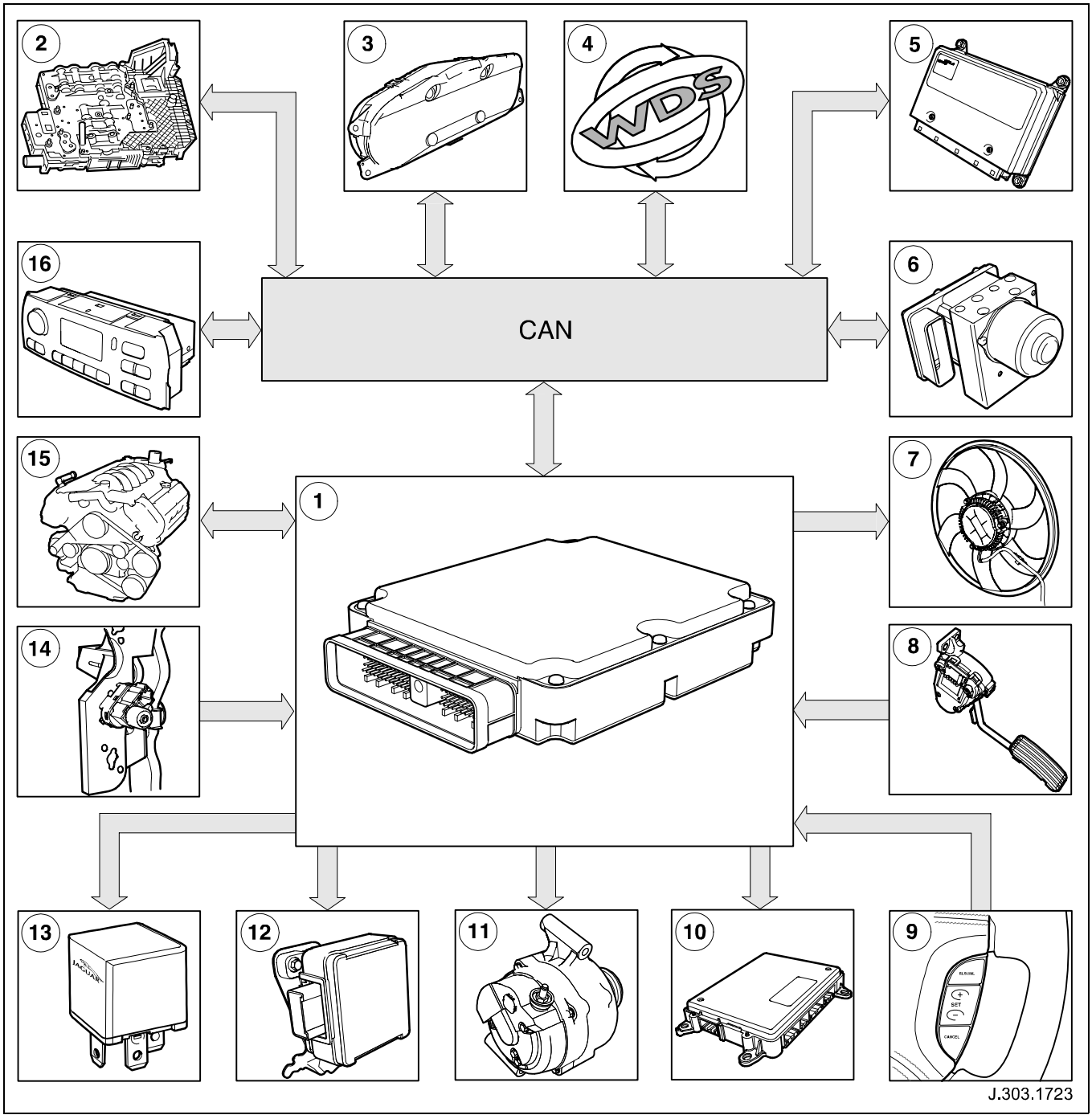


Fig. 52 System interfaces

Key to Fig. 52

1. Engine control module
2. Transmission control module (TCM)
3. Instrument cluster
4. Diagnostics
5. Air suspension module (ASM)
6. ABS / TC / DSC
7. Fan control module - integrated with fan motor
8. Accelerator pedal - electronic throttle control
9. Cruise control switches
10. Fuel pump driver module - integrated in rear electronic module (REM)
11. Alternator
12. Second fuel pump driver module - supercharged vehicles only
13. Starter relay
14. Brake pedal switches
15. Engine
16. Climate control module

Engine Interface

NOTE: The following is an overview of the engine interface only.

Fuel Injection

- The ECM controls one injector per-cylinder in sequential operation.
- The size of the injector used, is determined so that:
  - exact fuel control is possible at minimum engine load, with the allowance for purge valve correction,
  - and also to provide a sufficient fuel-flow at all engine speeds and maximum engine load.

- The timing of injector-firing relative to intake valve closing, during normal starting and running conditions, is optimized to provide:
  - the best compromise between emissions and performance,
  - and time to first-ignition and smooth engine operation at start-up, for all engine conditions at all temperatures.

- The mass of fuel required per-injection is derived from a calculation based on a ratio-metric match to the metered airflow.
- The ECM is capable of adapting to fuel system tolerances and engine internal wear under all operating conditions.
- The ECM continuously monitors the differential pressure between the fuel rail and plenum, and uses this value to calculate the injector pulse-width with the required mass of fuel per-injection.
- The ECM continuously monitors the temperature of the fuel being injected into the engine and provides compensation for the changing flow characteristics of the fuel system at different temperatures.
- The ECM continuously monitors the battery supply voltage and using this information the ECM ensures that the fuel supply to the engine is unaffected by voltage fluctuation.

Ignition

The system uses one individual ignition coil per-cylinder.

- Base ignition map: provided so that the engine can be optimized for emissions, fuel economy, performance and avoidance of cylinder knock throughout its speed and load range.
- Ignition timing during starting: initialized and used during engine cranking and under-speed modes to provide the best compromise between emissions, time to first-ignition and smooth engine operation at start-up, at all temperatures.
- Air intake temperature correction: provision is made to compensate for the effect of changing air intake temperature on the combustion detonation limit.
- Knock control: the system contains the necessary hardware for the detection of combustion knock within the engine cylinders, the ECM uses this information to gradually adjust the ignition timing until the combustion knock is at a safe and inaudible level.

Variable Valve Timing (Normally Aspirated Engines)

The ECM controls the fully-variable phase change system which acts on the intake camshafts.

- The target position of both camshafts is optimized to provide the best compromise between performance, refinement, fuel economy, and emissions.
- During transient operation the rate of change of the camshaft position is controlled to provide a smooth vehicle operation.
- Operation of variable valve timing (VVT) will be restricted if environmental conditions exist that could affect normal operation of the VVT, for example very low ambient temperatures.
- Provision is made to ensure that the intake camshafts are restrained in the retard position during engine start.
- The ECM will detect a VVT mechanical malfunction, and act to compensate for the malfunction.

Variable Air Intake System (V6 Engines)

- The ECM controls two intake manifold tuning valves (IMT valves). Each valve is a two positional device; the switching point of the valve is dependant on engine speed and a definable change in engine performance.
- The valve switching points are optimized for maximum torque in the wide-open throttle position.

Exhaust Gas Recirculation (V8 Engines)

- The ECM controls the flow of exhaust gases to reduce oxides of nitrogen (NOx) in emissions by recirculating metered amounts of exhaust gas into the intake of the engine. This lowers the combustion temperature, limiting the formation of NOx.
- The exhaust gas recirculation (EGR) flow is optimized for fuel economy, emissions, and a smooth vehicle operation for all engine operating conditions.

Interface to Electronic Throttle

- The system incorporates an electronic throttle to control the airflow into the engine under closed-loop feedback control of the ECM.
- The correct throttle-disc position is calculated as a function of driver demand value and of the engine's momentary operating mode.
- A fail-safe system is incorporated that complies with legislative requirements, including mechanical limp-home operation.

Idle Speed Control

- Idle speed is dependant on engine coolant temperature and gear selection (neutral or drive).
- Idle speed is optimized for combustion stability, idle quality, idle-speed control capability, and fuel economy at all operating conditions.
- Compensations to the idle speed will be made for conditions, such as variable ambient air temperature, to increase idle speed to satisfy charging system requirements.

Vehicle Speed Control

- The system incorporates a speed control system. The speed control switches are momentary action and are mounted on the steering wheel. This enables the driver to set a speed, and control and maintain the speed of the vehicle without having to operate the accelerator pedal.
- The function of the switches is organized so that a function relating to a switch of a higher priority always overrides a function relating to a lower priority switch. The switch priority is shown in descending order:
  1. Cancel
  2. Set
  3. Resume

Failure Modes and Effects Management

- Each electronic engine control function will revert to a default value if the signal controlling the function is out of normal operating range.
- System fault diagnosis is achieved using WDS.

Function of Sensors and Actuators

- Fuel injector:
  - Delivers fuel to the engine cylinder intake ports in sequential order. There are 12 fuel injection-holes per injector, delivering fuel droplets as small as 60 microns in diameter. This size of fuel droplet reduces fuel wetting of the intake port and promotes excellent fuel-air mixing. Reducing noxious emissions and improving fuel economy while the engine is warming up.
- On-plug ignition coil with integrated amplifier:
  - The ECM controls one coil per spark plug in sequential order. The ignition coil provides the energy to the spark plug to ignite the air/fuel mixture in the engine cylinder. The ignition coil works on the principle of 'mutual induction', by closing and then opening the ignition-coil primary circuit. The primary current increases, and then suddenly decreases to induce the high voltage in the secondary circuit needed to fire the spark plug.
- Camshaft position sensor:
  - Signals from the camshaft position sensors are used to synchronize the ECM to the engine cycle during engine starting. For example, whether the crankshaft position sensor is indicating an induction or firing stroke.
  - The position of both intake camshafts is monitored to allow the ECM to control the phase of the intake camshafts relative to the position of the crankshaft.
  - On engines with VVT the camshaft position sensor provides feedback control on the intake camshaft's position relative to the position of the crankshaft and exhaust camshafts.
- Oil control solenoid — variable valve timing (normally aspirated engines):
  - The oil control solenoid is a hydraulic actuator, which advances and retards the intake camshaft timing, thereby altering the camshaft-to-crankshaft phasing.
- Manifold absolute pressure sensor:
  - The manifold absolute pressure sensor (MAP sensor) is used for EGR diagnostic testing only.
- Knock sensor:
  - The knock sensors produce a voltage signal with respect to the engine's combustion knock level.
  - The knock sensor detects and reports combustion knock within the engine cylinders, the ECM uses this information to gradually adjust the ignition timing until the combustion knock is at a safe and inaudible level. The knock control system cannot advance the ignition past the mapped values. It retards the ignition timing to reduce combustion knock and then advances to its original value.
- Fuel pressure sensor:
  - Continuously monitors the fuel pressure between the fuel rail and plenum, this value is used by the ECM as one of its factors to calculate the injector pulse-width required to deliver the correct mass of fuel per injection.
  - The ECM also uses this information to demand a specific fuel flow-rate from the fuel pump via the fuel pump module.
- Engine fuel temperature sensor:
  - Continuously monitors the temperature of the fuel being injected into the engine. The ECM uses this value to provide compensation for the changing flow-characteristics of the fuel system when affected by changes in temperature.
- Intake manifold tuning valves (V6 engines):
  - The intake manifold tuning valves (IMT valves) are a two positional 'open or close' device used to create a variable air intake system. The position of the IMT valves is switched, via signals from the ECM, to optimize torque across the engine's speed and load range.
  - The IMT valves work in conjunction with the operation of the throttle-body sensors.
- Throttle body assembly:
  - The throttle body controls the airflow into the engine by use of the throttle motor andthrottle position sensor (TP sensor).
  - The throttle motor, via signals received from the accelerator-pedal position sensor, operates the throttle disc position; the ECM transmits these signals.
  - The ECM via the TP sensor, monitors throttle-disc angle.
  - The ECM on the application of external loads, for example the air conditioning compressor, makes compensation to the throttle disc angle.

- Mass air flow sensor with integrated intake air temperature sensor:
  - The mass airflow sensor (MAF sensor) informs the ECM of the rate of airflow entering the engine by producing a voltage which increases as the rate of airflow increases.
  - The MAF sensor also takes into account the density of air entering the engine so it is possible to maintain the required air to fuel ratio, and compensate for variations in atmospheric pressure temperatures.
  - The integral intake air temperature sensor (IAT sensor) measures the temperature of the air entering the intake system. The ECM uses this information to compensate for higher than normal air intake temperatures upon combustion detonation.
- Crankshaft position sensor:
  - The crankshaft position sensor (CKP sensor) is an inductive pulse generator, which scans protrusions on a pulse ring, to inform the ECM of the crankshaft's position and engine speed.
- Engine coolant temperature sensor:
  - The thermistor type sensor provides an input signal to the ECM, which is proportional to the temperature of the coolant circulated around the coolant system.
- Engine oil temperature sensor:
  - The thermistor type sensor provides an input signal to the ECM which is proportional to the temperature of the oil circulated around the engine oil passageways.
- Heated oxygen sensor 1:
  - The heated oxygen sensor 1 (HO2 sensor 1), is a linear characteristic type sensor, fitted forward of the exhaust system's catalytic converter.
  - The sensor is used by the ECM as a primary sensor to measure oxygen content within the exhaust system.
  - The sensor used in conjunction with the ECM provides closed-loop fuelling control.
- Heated oxygen sensor 2:
  - The Heated oxygen sensor 2 (HO2 sensor 2), is a non-linear characteristic type sensor fitted to the exhaust system's catalytic converter.
  - The sensor is used by the ECM as a secondary sensor to measure oxygen content within the exhaust system.
  - Used in conjunction with the ECM and the HO2 sensor 1, the HO2 sensor 2, aids closed-loop fuelling control.
  - The sensor also monitors catalyst efficiency.
- Exhaust gas recirculation valve:
  - As controlled by the ECM, a defined portion of the engine's exhaust emissions are extracted and returned to the intake mixture via a solenoid valve.
- Air intake control-flap solenoid (supercharged engine):
  - The ECM directly controls the solenoid, to open and close the air intake control-flap in the air-cleaner assembly. The control flap opens at high engine speeds and loads to satisfy engine air-charge requirements.
- Engine oil pressure switch:
  - The switch is connected to the instrument cluster and is not directly used as part of the engine control system.

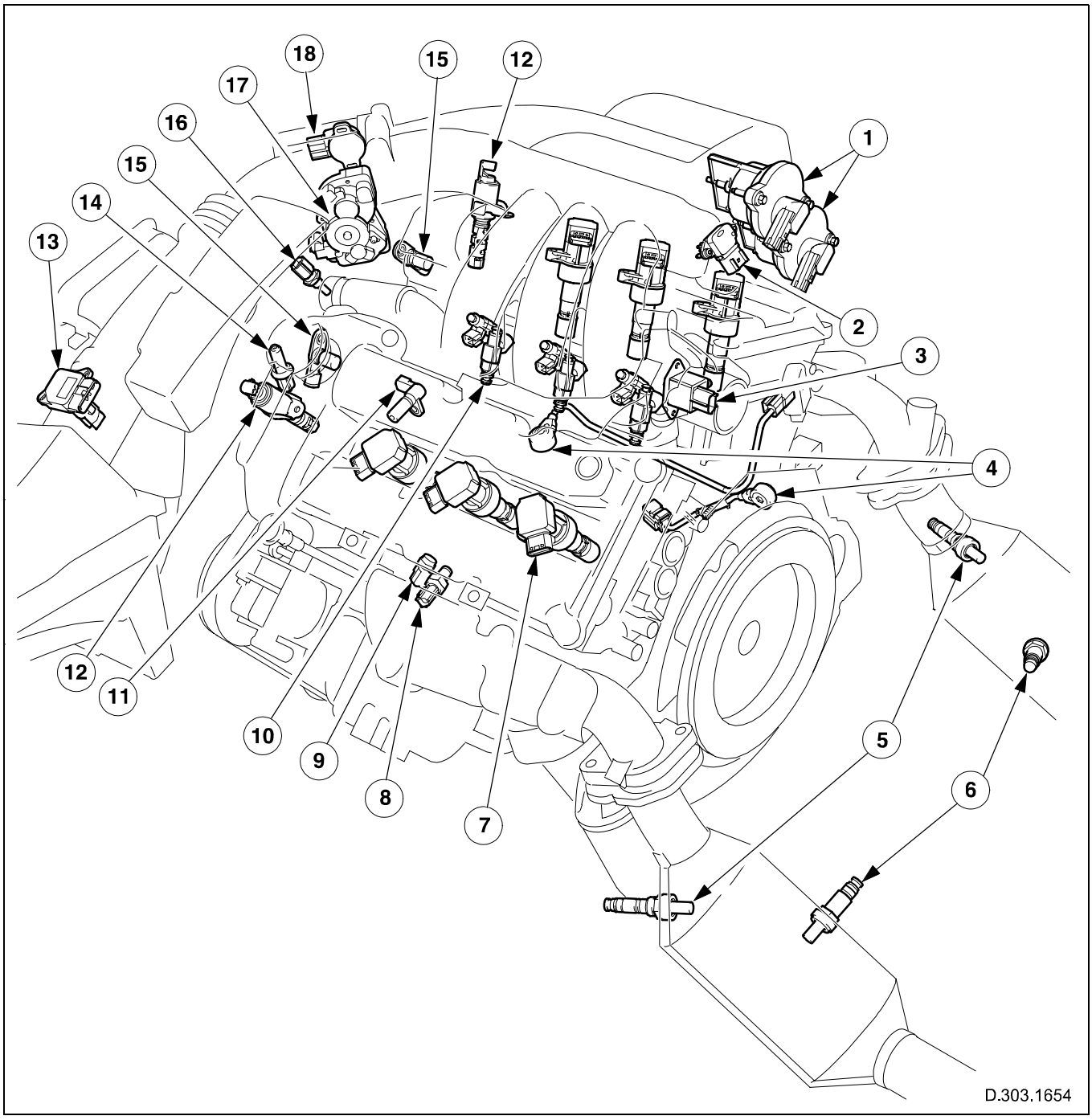


Fig. 53 V6 Normally Aspirated Engine — sensor and actuator location

Key to Fig. 53

1. Intake manifold tuning valves
2. Manifold absolute pressure sensor
3. Fuel pressure sensor
4. Knock sensors
5. Heated oxygen sensor 1
6. Heated oxygen sensor 2
7. On-plug ignition coil with integrated amplifier
8. Engine oil pressure switch
9. Engine oil temperature sensor
10. Fuel injector
11. Crankshaft position sensor
12. Oil control solenoid — variable valve timing
13. Mass air flow sensor with integrated intake air-temperature sensor
14. Engine fuel temperature sensor
15. Camshaft position sensor
16. Engine coolant temperature sensor
17. Throttle motor
18. Throttle position sensor

The arrows represent the ECM's input and output signals.

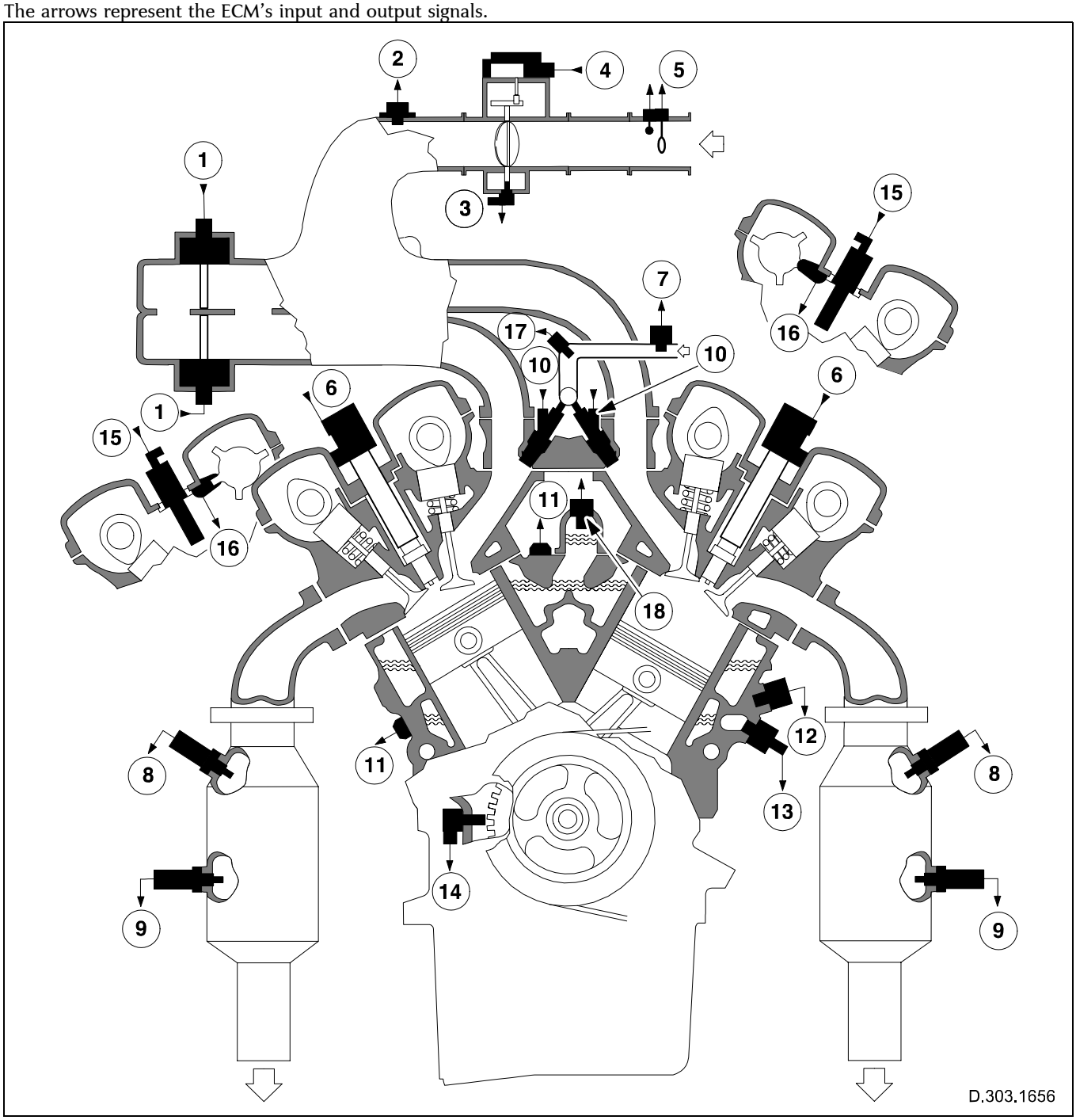


Fig. 54 V6 Normally Aspirated Engine — sensors and actuators schematic

Key to Fig. 54

1. Intake manifold tuning valves
2. Manifold absolute pressure sensor
3. Throttle position sensor
4. Throttle motor
5. Mass air flow sensor with integrated intake air-temperature sensor
6. On-plug ignition coil with integrated amplifier
7. Fuel pressure sensor
8. Heated oxygen sensor 1
9. Heated oxygen sensor 2
10. Fuel injector
11. Knock sensor
12. Engine oil pressure switch
13. Engine oil temperature sensor
14. Crankshaft position sensor
15. Oil control solenoid — variable valve timing
16. Camshaft position sensor
17. Engine fuel temperature sensor
18. Engine coolant temperature sensor

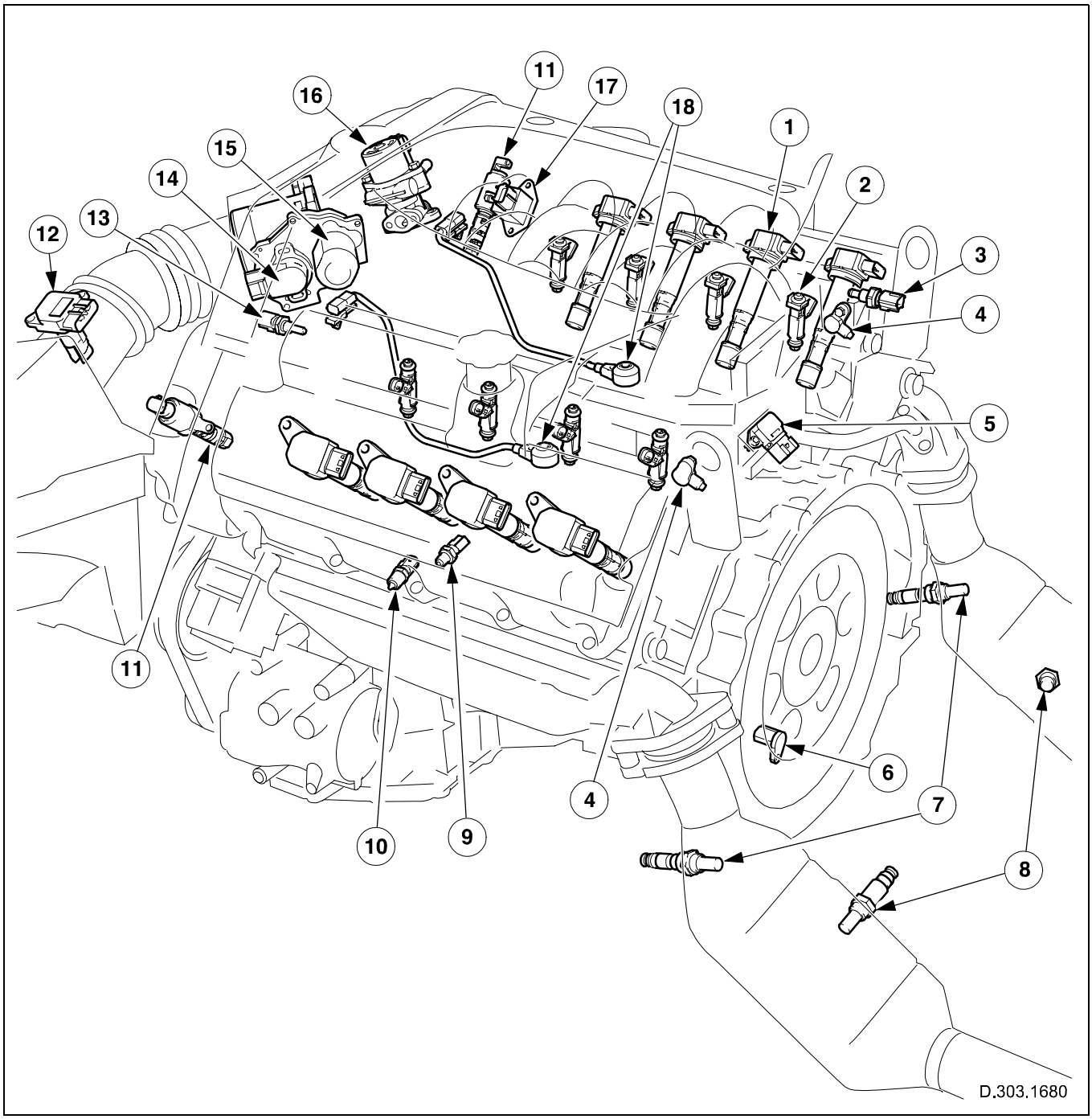


Fig. 55 V8 Normally Aspirated Engine — sensor and actuator location

Key to Fig. 55

1. On-plug ignition coil with integrated amplifier
2. Fuel injector
3. Engine fuel temperature sensor
4. Camshaft position sensor
5. Manifold absolute pressure sensor
6. Crankshaft position sensor
7. Heated oxygen sensor 1
8. Heated oxygen sensor 2
9. Engine oil pressure switch
10. Engine oil temperature sensor
11. Oil control solenoid — variable valve timing
12. Mass air flow sensor with integrated intake air-temperature sensor
13. Engine coolant temperature sensor
14. Throttle position sensor
15. Throttle motor
16. Exhaust gas recirculation valve
17. Fuel pressure sensor
18. Knock sensor

The arrows represent the ECM's input and output signals.

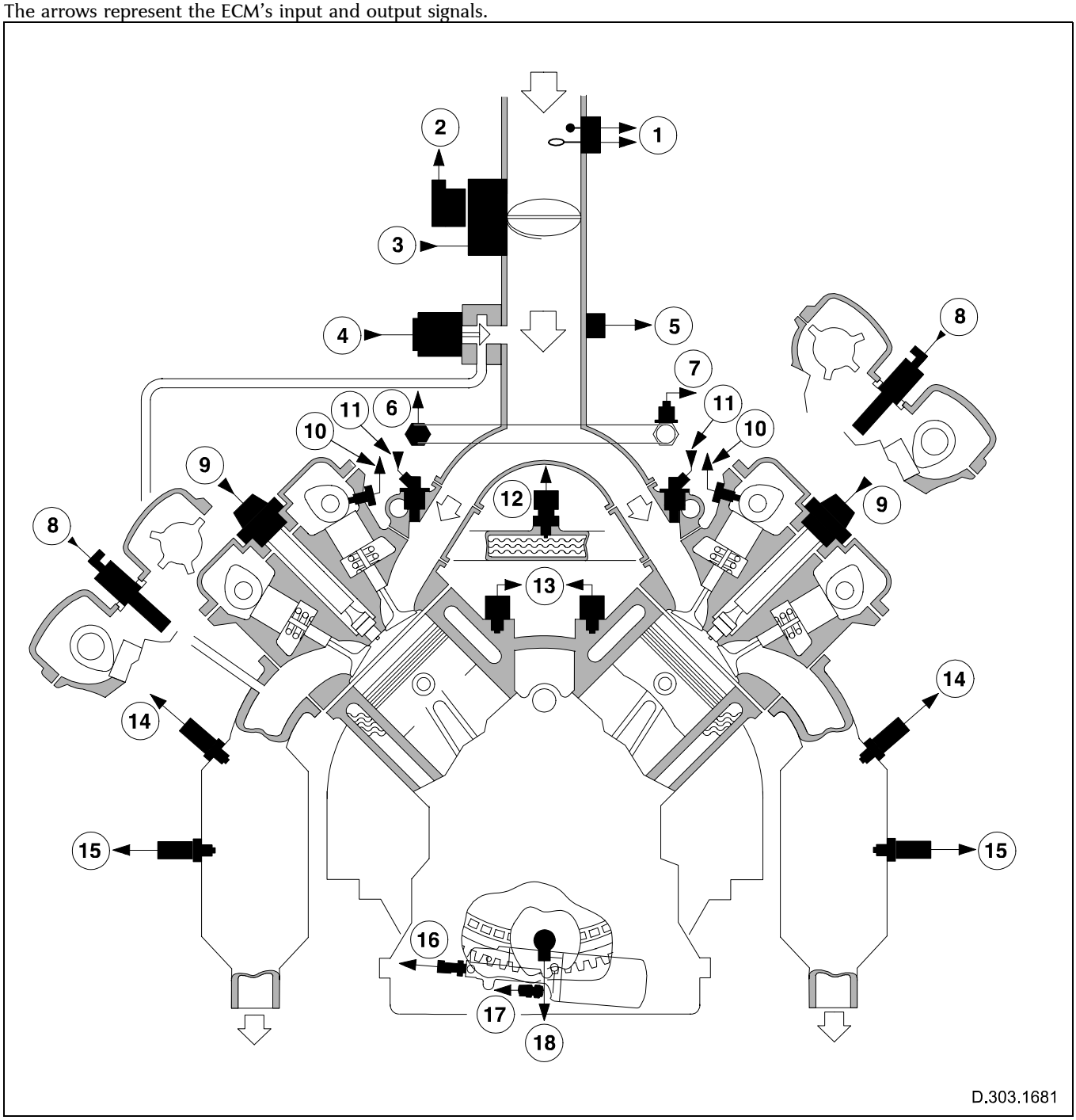


Fig. 56 V8 Normally Aspirated Engine — sensors and actuators schematic

Key to Fig. 56

1. Mass air flow sensor with integrated intake air-temperature sensor
2. Throttle position sensor
3. Throttle motor
4. Exhaust gas recirculation valve
5. Manifold absolute pressure sensor
6. Engine fuel temperature sensor
7. Fuel pressure sensor
8. Oil control solenoid — variable valve timing
9. On-plug ignition coil with integrated amplifier
10. Camshaft position sensor
11. Fuel injector
12. Engine coolant temperature sensor
13. Knock sensor
14. Heated oxygen sensor 1
15. Heated oxygen sensor 2
16. Engine oil pressure switch
17. Engine oil temperature sensor
18. Crankshaft position sensor

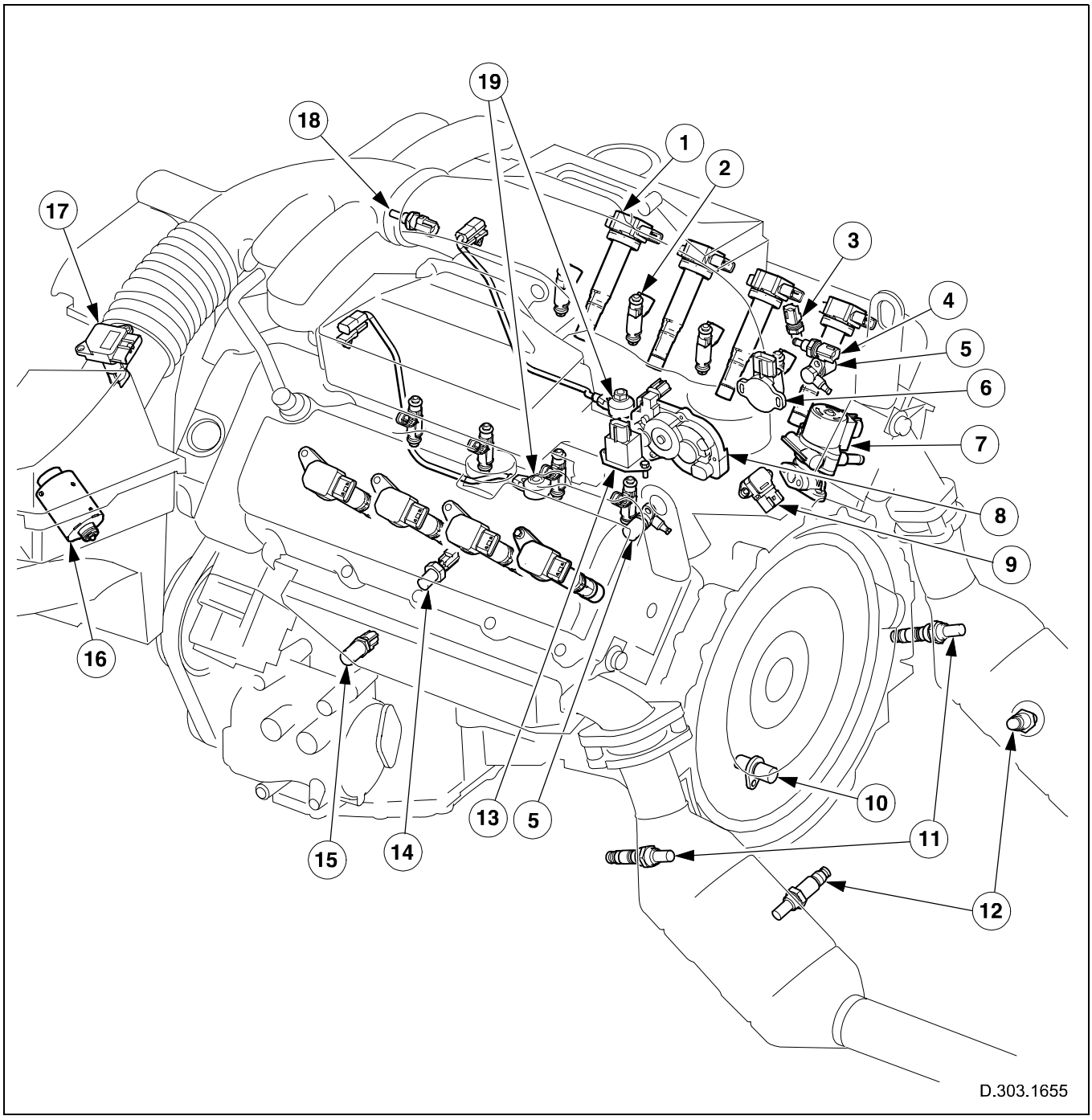


Fig. 57 V8 supercharged Engine — sensor and actuator location

Key to Fig. 57

1. On-plug ignition coil with integrated amplifier
2. Fuel injector
3. Air temperature sensor
4. Engine fuel temperature sensor
5. Camshaft position sensor
6. Throttle position sensor
7. Exhaust gas recirculation valve
8. Throttle motor
9. Manifold absolute pressure sensor
10. Crankshaft position sensor
11. Heated oxygen sensor 1
12. Heated oxygen sensor 2
13. Fuel pressure sensor
14. Engine oil pressure switch
15. Engine oil temperature sensor
16. Air intake control-flap solenoid
17. Mass air flow sensor with integrated intake air-temperature sensor
18. Engine coolant temperature sensor
19. Knock sensor

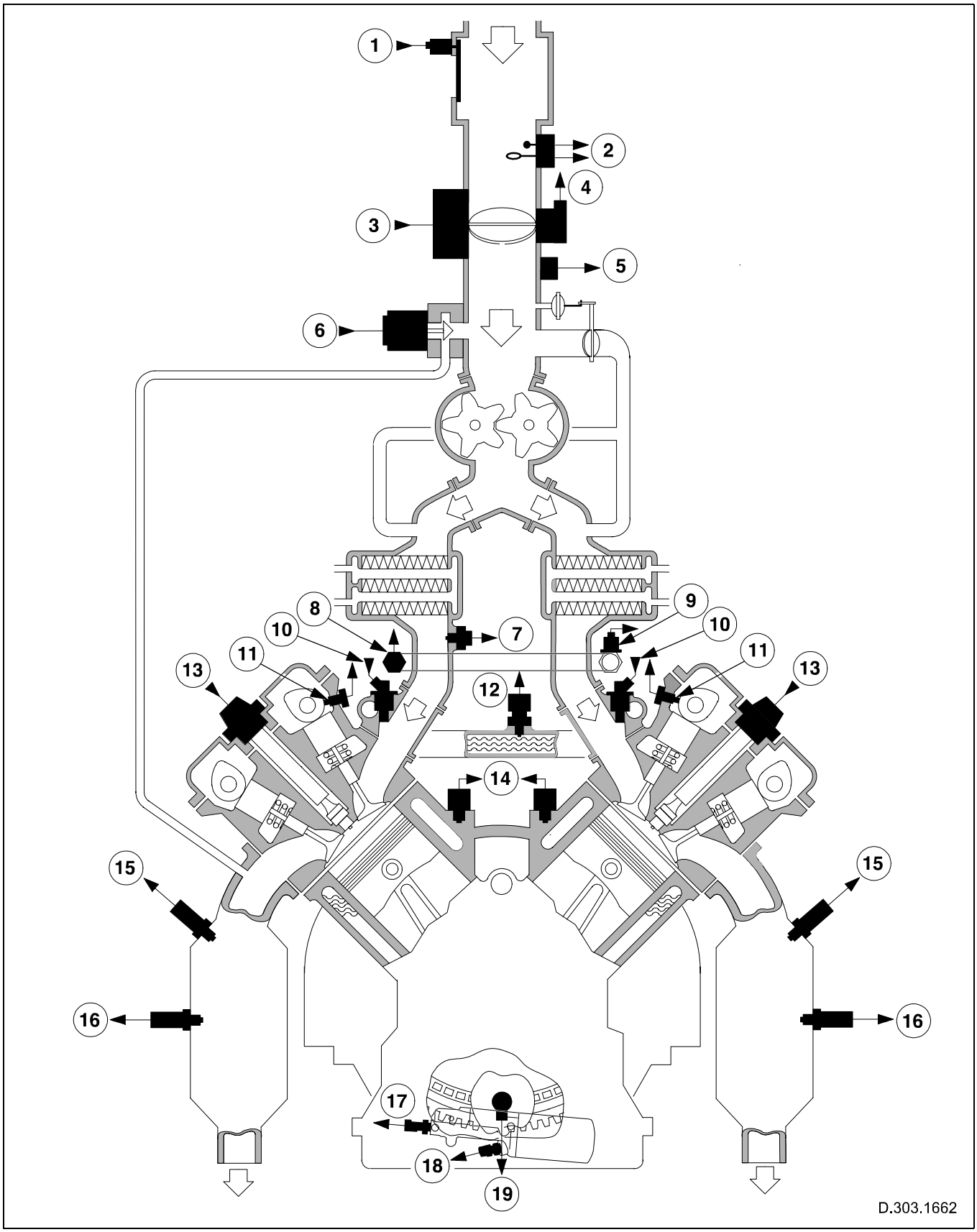


Fig. 58 V8 supercharged Engine — sensors and actuators schematic

Key to Fig. 58

1. Air intake control-flap solenoid
2. Mass air flow sensor with integrated intake air-temperature sensor
3. Throttle motor
4. Throttle position sensor
5. Manifold absolute pressure sensor
6. Exhaust gas recirculation valve
7. Air temperature sensor
8. Engine fuel temperature sensor
9. Fuel pressure sensor
10. Fuel injector
11. Camshaft position sensor
12. Engine coolant temperature sensor
13. On-plug ignition coil with integrated amplifier
14. Knock sensor
15. Heated oxygen sensor 1
16. Heated oxygen sensor 2
17. Engine oil pressure switch
18. Engine oil temperature sensor
19. Crankshaft position sensor

Automatic Transmission

Introduction

A six-speed, electronically controlled, automatic transmission is introduced into the new XJ, which is compatible with all engine applications. The transmission has been specially developed for vehicles with an engine torque of up to 600 Newton-meters (Nm).

In comparison to the previous five-speed transmission, the six-speed transmission provides:

- Higher torque capacity;
- Reduced length;
- Reduced weight;
- Reduced assembly components;
- Improved fuel consumption;
- Improved vehicle performance.

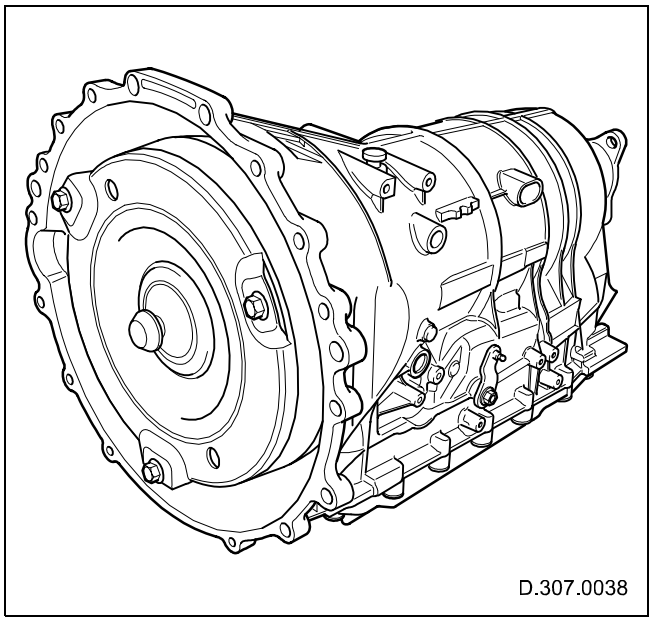


Fig. 59 Automatic transmission

The transmission is physically different for V6 and V8 engine applications. The main difference is that the V8 application has recesses in the bell housing to accommodate the exhaust catalysts.

Key Data

- Six forward gears;
- One reverse gear;
- Coaxial planetary transmission;
- Hydrodynamic torque converter with an integral converter lock-up clutch;
- Hydraulic valve body with integral transmission control module;
- Electronic-hydraulic shift point position and gear shift control;
- Manual shifting;
- Self-diagnosis;
- Fill for life transmission fluid.

Gear Ratios

1st - 4.17:1
2nd - 2.34:1
3rd - 1.52: 1
4th - 1.14:1
5th - 0.87:1
6th - 0.69:1
Reverse - 3.40:1

Transmission Operation

- The transmission unit uses planetary gears with hydraulic-electronic control.
- The valve body and transmission control module (TCM) form a combined element, installed in the transmission's fluid pan.
- The TCM uses a newly developed shift strategy known as adaptive shift strategy.

Engine power reaches the transmission via a torque converter with an integral converter lock-up clutch. The six-forward gears and one-reverse gear are obtained from a single-web planetary gear set, followed by a double planetary gear set, known as the Lepelletier-type gear sets. These gears make it possible to obtain six-forward speeds.

Gear selection is achieved by controlling the flow of automatic transmission fluid to operate various internal clutches. The TCM controls the electrical components for gear-selection shift pressure and torque converter slip-control. In the event of a system malfunction the TCM provides failure-mode effect management, to maintain maximum functional operation of the transmission, with minimum reduction in vehicle and occupant safety.

In the event of loss of transmission control through electrical power failure, the basic transmission functions: Park, Reverse, Neutral and Drive are retained by the hydraulic system. The transmission will operate in limp-home mode: third or fifth gear fixed, dependent upon gear selection at the time of the malfunction.

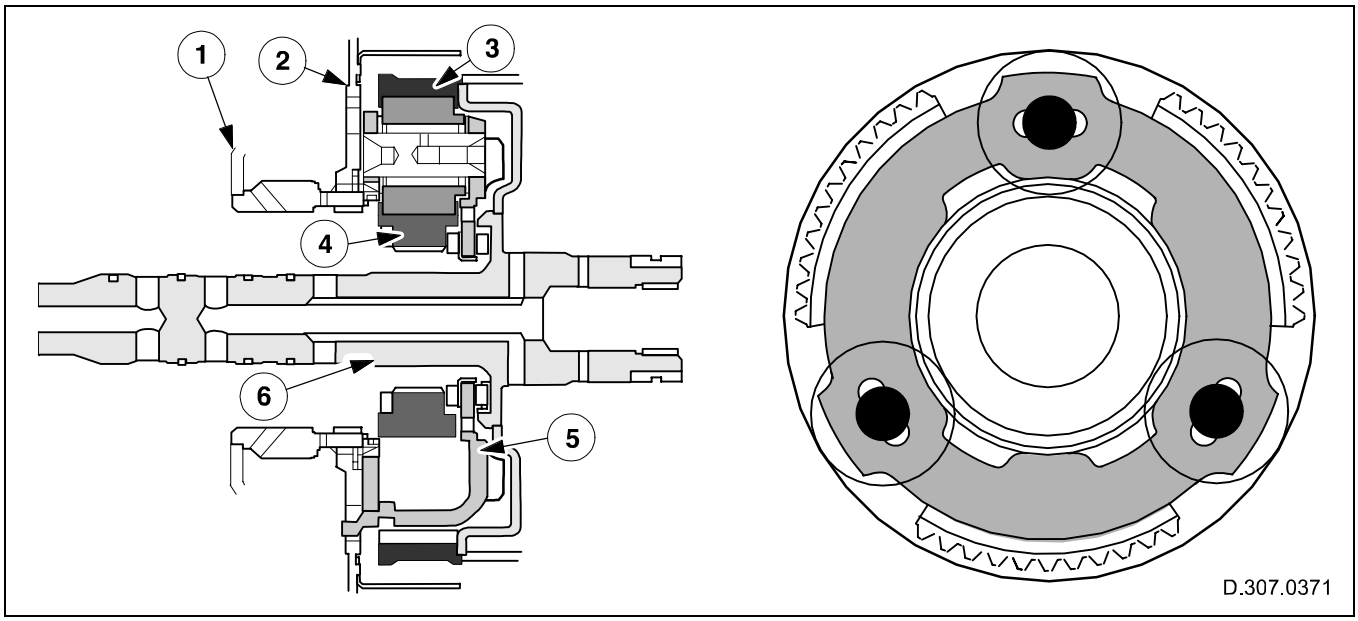


Fig. 60 Single-web planetary gear set

1. Cylinder
2. Baffle plate
3. Ring gear
4. Planetary gear
5. Planetary gear spider
6. Turbine shaft

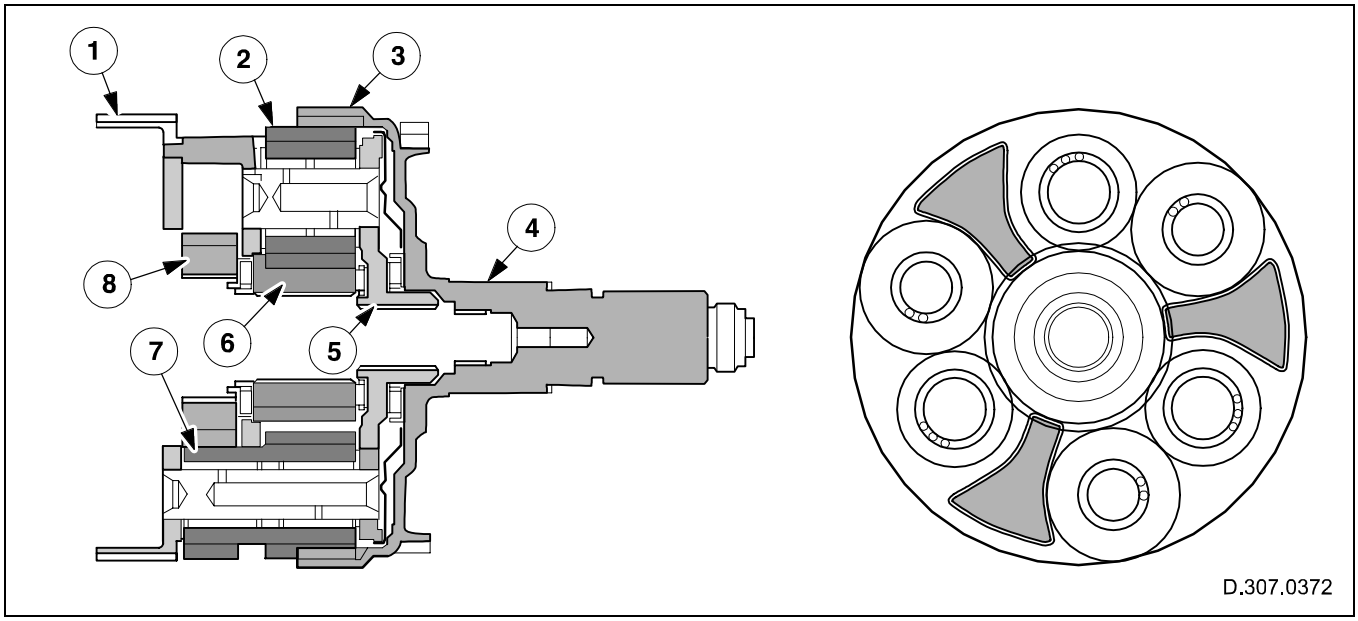


Fig. 61 Double-web planetary gear set

1. Planetary gear spider
2. Planetary gears (short)
3. Ring gear
4. Output
5. Planetary gear spider
6. Sunwheel
7. Double planetary gears (long)
8. Sunwheel

Parking Lock

The parking lock acts by inserting a pawl into the teeth of the parking lock gearwheel on the transmission output shaft.

Fluid Pump

The half-moon type fluid-pump is located between the torque converter and transmission housing. The pump is driven directly by the engine via the torque converter shell, and supplies fluid to the transmission and valve body. The pump draws in fluid through a filter and delivers it at high-pressure to the main pressure valve in the valve body. The valve adjusts the pressure and returns excess fluid to the fluid pan.

Torque Converter

The torque converter is a three-element unit containing a single-plate lock-up clutch and torsional vibration damper. The lock-up clutch eliminates slip in the torque converter, therefore helping to keep engine fuel consumption to a minimum. The lock-up clutch can be controlled and engaged in any of the six forward gears.

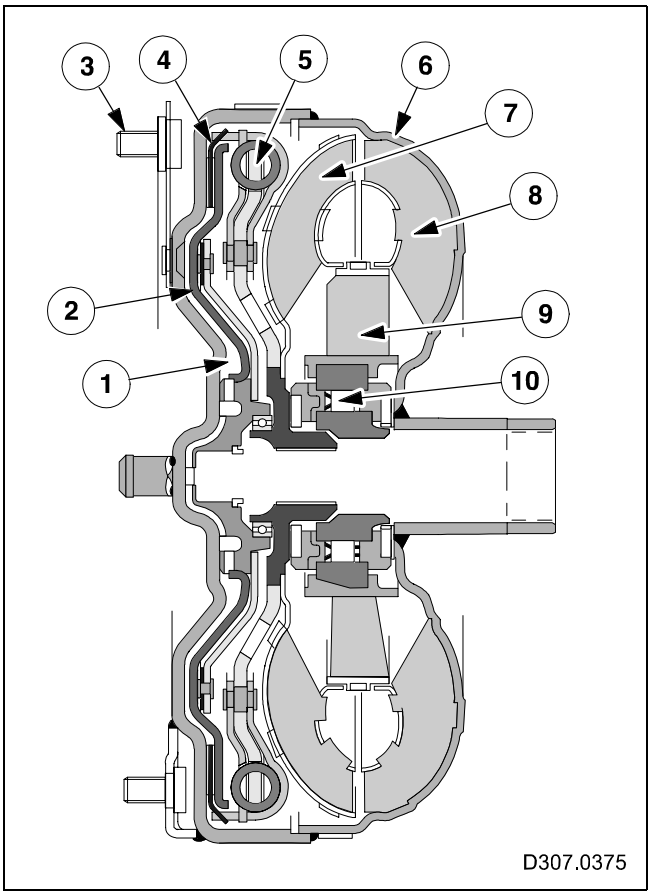


Fig. 62 Torque converter with torsional vibration damper

1. Space behind lock-up clutch
2. Lock-up clutch piston
3. Attachment to flywheel
4. Lined plate of lock-up clutch
5. Torsional vibration damper
6. Converter cover
7. Turbine
8. Impeller
9. Stator
10. Stator freewheel

Shift Elements

In addition to the torque converter lock-up clutch the other shift elements are:

- Three rotating multi-plate clutches ‘A’, ‘B’ and ‘E’.
- Two fixed multi-disc brakes ‘C’ and ‘D’.

All gear shifts ‘1st to 6th’ or from ‘6th to 1st’, are power-on overlapping shifts. When during a shift, one of the clutches must continue to transmit the drive at lower main pressure until the other clutch is able to accept the input torque.

The shift elements, clutches or brakes are engaged hydraulically. The fluid pressure is built up between the cylinder and the piston, therefore pressing the plates together. When fluid-pressure drops, the cup-spring that is pressing against the piston moves it back to its original position. The purpose of these shift elements is to perform in-load shifts with no interruption to traction. Multi-plate clutches ‘A’, ‘B’ and ‘E’ supply power from the engine to the planetary gear train. Multi-disc brakes ‘C ’ and ‘D’ press against the transmission housing in order to achieve a torque reaction effect.

Shift Overlap Control

Another feature of the transmission, is that freewheels (one-way clutches) are replaced by actuation of the relevant clutches when overlap gearshift takes place. This arrangement provides a reduction in transmission weight and size.

The electronic-hydraulic shift action is obtained by means of various valves in the valve body being actuated by pressure regulators. They engage or disengage the relevant clutches or brakes at the correct moments.

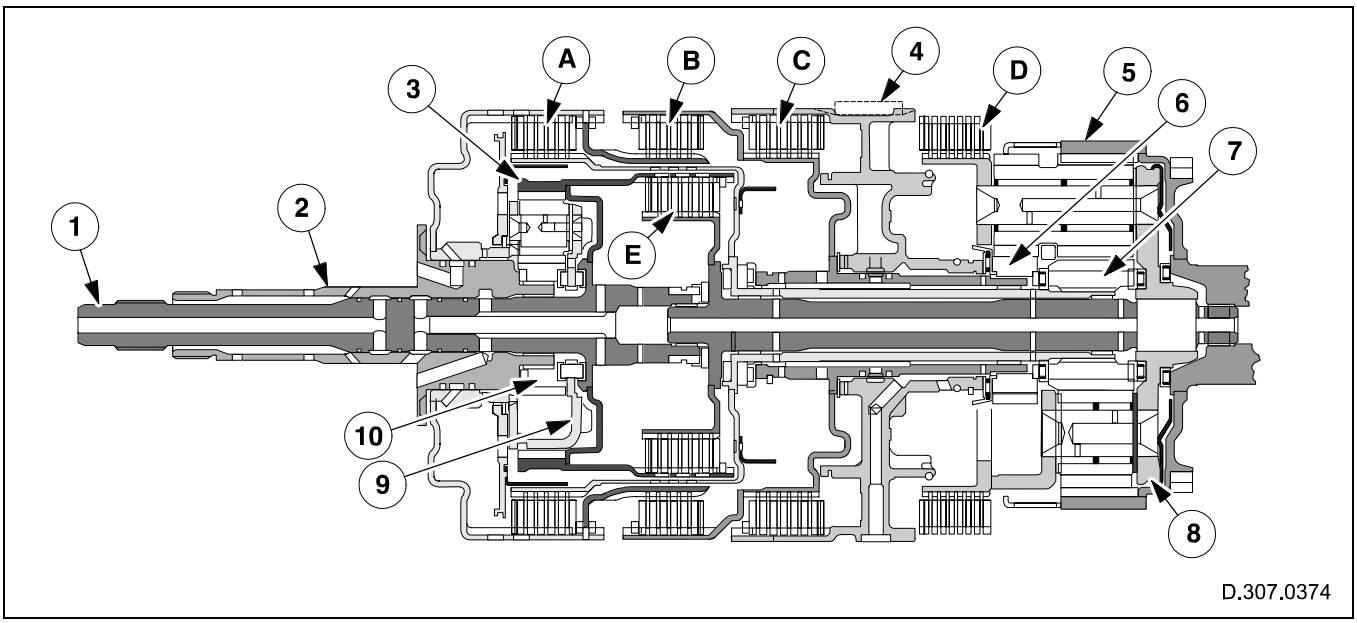


Fig. 63 Shift elements

A. Clutch
B. Clutch
C. Brake
D. Brake
E. Clutch
1. Turbine shaft
2. Stator shaft
3. Ring gear 1
4. Shaft key — fixed connection to transmission housing
5. Ring gear 2
6. Sunwheel 2
7. Sunwheel 3
8. Double planetary gear carrier
9. Planetary gear spider
10. Sunwheel 1

Transmission Control Module / Valve Body

The transmission control module (TCM) and valve body are a combined unit, installed in the transmission's fluid pan.

This combination of components provides the following advantages:

- Minimum tolerances, as the TCM is directly connected to the solenoids;
- Better coordination of gearshifts;
- Increased refinement;
- Optimized shift quality;
- Good reliability, since the number of plug connections and interfaces are reduced.

CAUTION: When working on the TCM/Valve body, precaution must be taken to avoid damage to the component through electrostatic discharge. Refer to 'JTIS' for further information.

The TCM controls the operation of the transmission, by processing signals, for example:

- transmission input and output speeds;

via the CAN:

- throttle pedal position;
- gear selector position;
- engine torque and speed;
- transmission fluid temperature;
- brake pedal status;
- engine oil temperature;
- engine coolant temperature;
- wheel speed.

Using these signals and stored information, the TCM calculates the correct gear and torque converter lock-up clutch setting, plus the optimum pressure settings for gear shift and lock-up clutch control.

Five pressure regulators and one solenoid valve are used to direct transmission-fluid flow, select internal clutches, and control the fluid pressure at the clutch for gear control. A separate pressure regulator is used exclusively for torque-converter clutch control. The TCM monitors input and output signals to confirm correct system operation. If a malfunction does occur, the TCM reverts to a default state and informs the driver of a problem via the instrument-cluster message center.

System diagnosis is performed using 'WDS'.

Sensors

Speed sensors

The TCM monitors the two transmission speed-sensors located on the valve body: one for measuring input shaft speed (turbine speed), and one for measuring output shaft speed.

Temperature sensor

The TCM uses the input signals from the temperature sensor located on the valve body, to activate various shift strategies.

Gearshift position sensor

The gearshift position sensor is located on the valve body. The TCM uses inputs from this sensor to determine the selected gear-range on the automatic side of the J-gate. Signals from the position sensor also ensure that the engine will only start when the gear selector is in the park or neutral position. The ECM uses the signals to prohibit operation of the starter relay if the incorrect gear is selected.

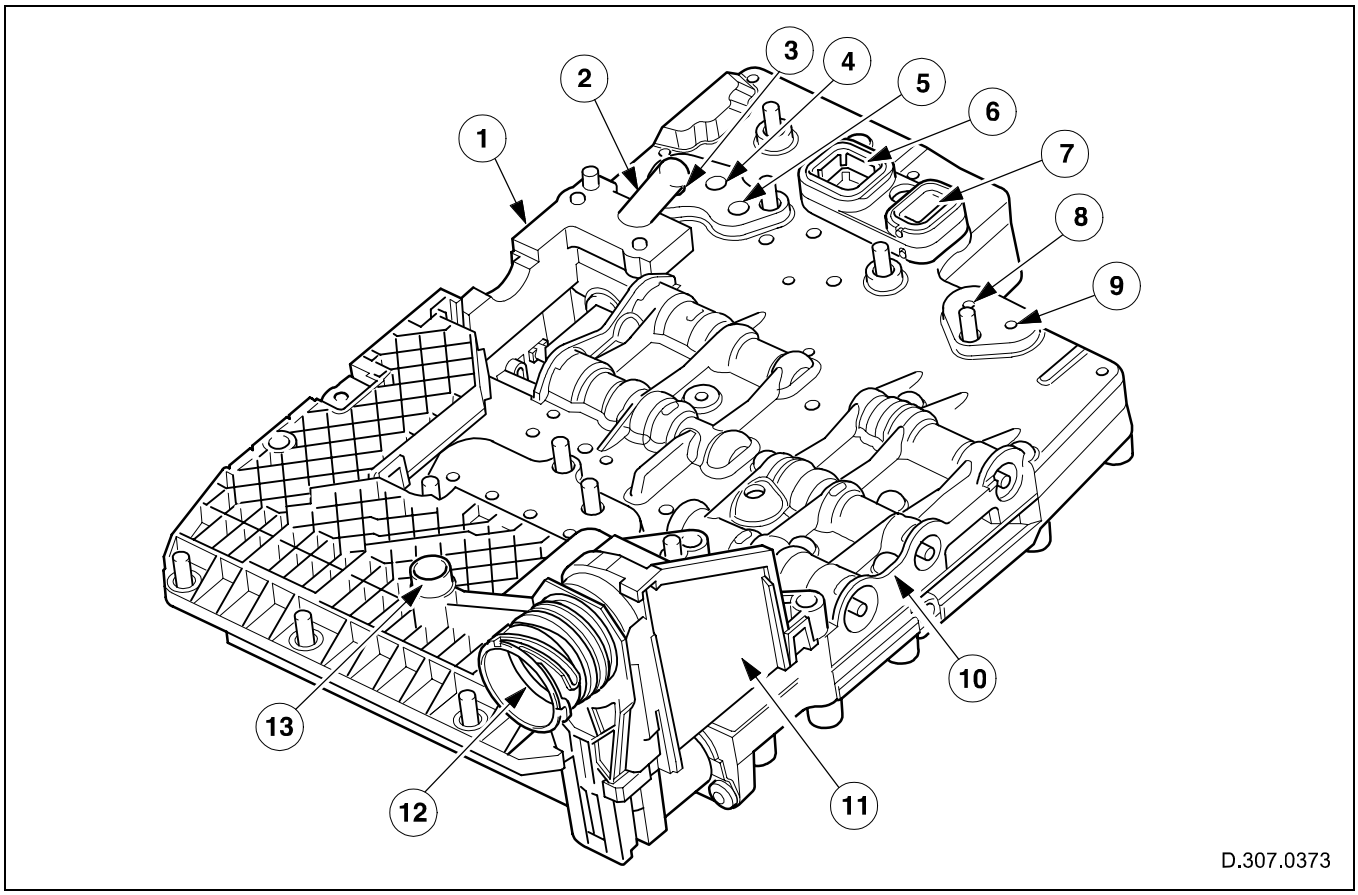


Fig. 64 Transmission Control Module / Valve Body

1. Position switch
2. Turbine speed sensor
3. To cooler
4. Converter lock-up clutch — engaged
5. Converter lock-up clutch — released
6. Discharge port
7. Suction port
8. Clutch 'E'
9. Clutch 'A'
10. Hydraulic valve body
11. Traction control module
12. Transmission plug
13. Output speed sensor

Safety Features

The safety features protect against incorrect operation by the driver and system malfunctions. For example:

- Each time the vehicle is started a 'fail-safe' check is performed on the TCM and associated electronics;
- A 'limp-home' mode is functioned, if a power failure occurs;
- Prevents reverse gear selection at forward speeds;
- Prevents manual gear down-shifting at excessive engine speeds.

Shift Selection

The TCM uses various driver selected modes and adaptive modes as below. Each mode introduces a different gear selection strategy, depending on driver requirements and driving conditions (vehicle status).

Driver selected modes:

- Normal mode:
  - Activated by the sports 'S' switch on the J-Gate surround, the switch does not illuminate when normal mode is selected.
  - Normal mode will remain active until the driver selects 'sports mode' or 'cruise control'. On the deactivation of 'cruise control', the system returns to the mode previously activated.
  - Normal mode can be overridden by various adaptive modes.
- Sport mode:
  - Activated by the sports 'S' switch on the J-Gate surround, the switch will illuminate when sport mode is selected.
  - The sport mode strategy enables gearshift points to be extended to higher engine speeds, and downshifts at lower accelerator-pedal angles.
  - Sport mode will remain active until the driver selects 'normal mode' or 'cruise control'. On the deactivation of 'cruise control', the system returns to the mode previously activated.
  - Sport mode can be overridden by various adaptive modes.
- Cruise control mode:
  - When activated the TCM receives signals from the ECM via the CAN.
  - The TCM implements a shift-map strategy to reduce gearshift activity and subsequently increase fuel economy.

Adaptive modes, these modes are selected automatically depending on driving conditions and vehicle status:

- Hot mode:
  - A gear selection and torque converter lock-up strategy is implemented, to reduce heat generated in the transmission when any of the following become hot enough to reach a critical threshold value:
    transmission fluid,
    transmission casing,
    engine oil,
    engine coolant temperature.
  - The hot mode strategy reduces generated heat by selecting higher gears and engaging the lock-up clutch at lower vehicle speeds.

  NOTE: With hot mode implemented the driver may experience unexpected up-shifts when running at high vehicle speeds and loads.
- Traction control mode:
  - Under normal driving conditions an increase or decrease in wheel speed would be recognized by the TCM as the vehicle accelerating or decelerating and a gear would be selected in proportion to the speed of wheel rotation.
  - In a situation where the vehicle is not accelerating in proportion to the wheel rotation speed, for example a slipping wheel. The TCM, in response to signals from the ABS module, will still command the transmission to select a higher-gear to help reduce wheel slip. The high gear will remain engaged until traction at the slipping wheel is regained.
- Gradient and towing mode:
  - The gradient and towing mode is activated when the TCM detects reduced vehicle acceleration at given throttle positions. This reduction in acceleration is recognized by the TCM as the vehicle either towing or ascending a gradient. Therefore, to provide the vehicle with maximum traction effort, a shift-map is used that extends the amount of time lower-gears are engaged, and subsequently delays the selection of higher gears.

Adaptive Shift Strategy

By increasing the linking of the transmission control system with other vehicle systems such as engine, brakes (ABS) and steering, a number of signals are made available to the TCM, which describe how the vehicle is being driven and on what road conditions. Using this information the TCM is able to exploit the vehicle's performance capability, and conversely maximize driving refinement and economy.

By monitoring signals associated to:

- longitudinal and lateral acceleration,
- engine speed and engine torque,
- engine oil temperature,
- position and movement of the accelerator, and
- individual wheel speed,

additional functions in the TCM can be realized. On the basis, of this information the TCM recognizes whether:

- the vehicle is maneuvering round a corner,
- all the wheels are gripping,
- the driver is braking,
- or if the driver wishes to accelerate.

From these signals, conclusions are made regarding the vehicle's actual load status and the topography of the stretch of road (uphill or downhill gradient), and what shift strategy should be applied to the transmission function.

For example, when 'sport' mode is selected and an enthusiastic driving style is detected on a demanding road. The TCM will adjust the transmission shift strategy to complement the conditions by inhibiting sixth-gear and selecting lower gears earlier to prevent 'hunting' between gears.

Under heavy braking, the TCM will select a lower gear to enable an immediate acceleration response on application of the accelerator pedal. Similarly, if the accelerator pedal is released rapidly following hard acceleration, selection of a higher gear is inhibited to increase engine braking and improve subsequent acceleration response.

To complement these features, when the TCM detects the vehicle rounding a corner, selection of a higher gear is inhibited until the vehicle exits the corner.

Once a more sedate driving style is detected, sixth gear will be reinstated and the shift strategy will return to normal.

Transmission Cooling

Transmission Fluid Cooler

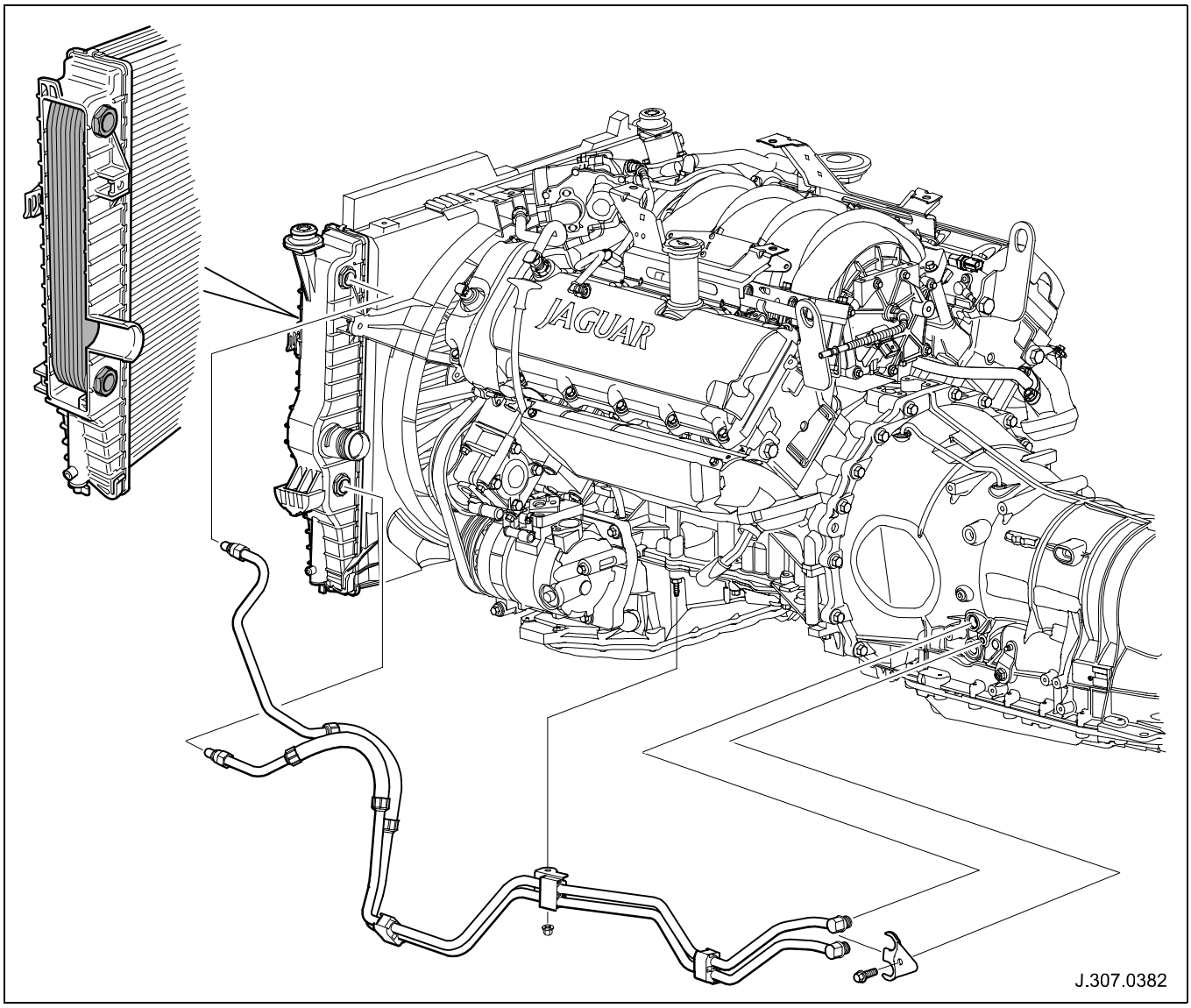


Fig. 65 Transmission cooling (V8 derivative shown)

The transmission fluid-cooler is integrated into the end-tank of the engine's coolant radiator. The fluid cooler is of aluminum construction, comprising tubes and louvered fin-cores. The tubes are arranged horizontally to provide a cross flow of the transmission fluid through the cooler. The engine coolant passes through the cooler's fins to provide the cooling effect.

This arrangement provides improved cooling performance in comparison to the air-cooled system, as the transmission-fluid temperature is controlled in conjunction with the engine coolant temperature. Improved temperature control is also achieved when the vehicle is at a standstill with the engine running.

Automatic Transmission External Controls

Transmission Selector Mechanism

The XJ incorporates a new design of transmission selector mechanism with:

- Improved mounting frame and installation method;
- Improved setting procedure;
- New design of selector interlock mechanism;
- New design of key interlock mechanism;
- Reduction in component weight.

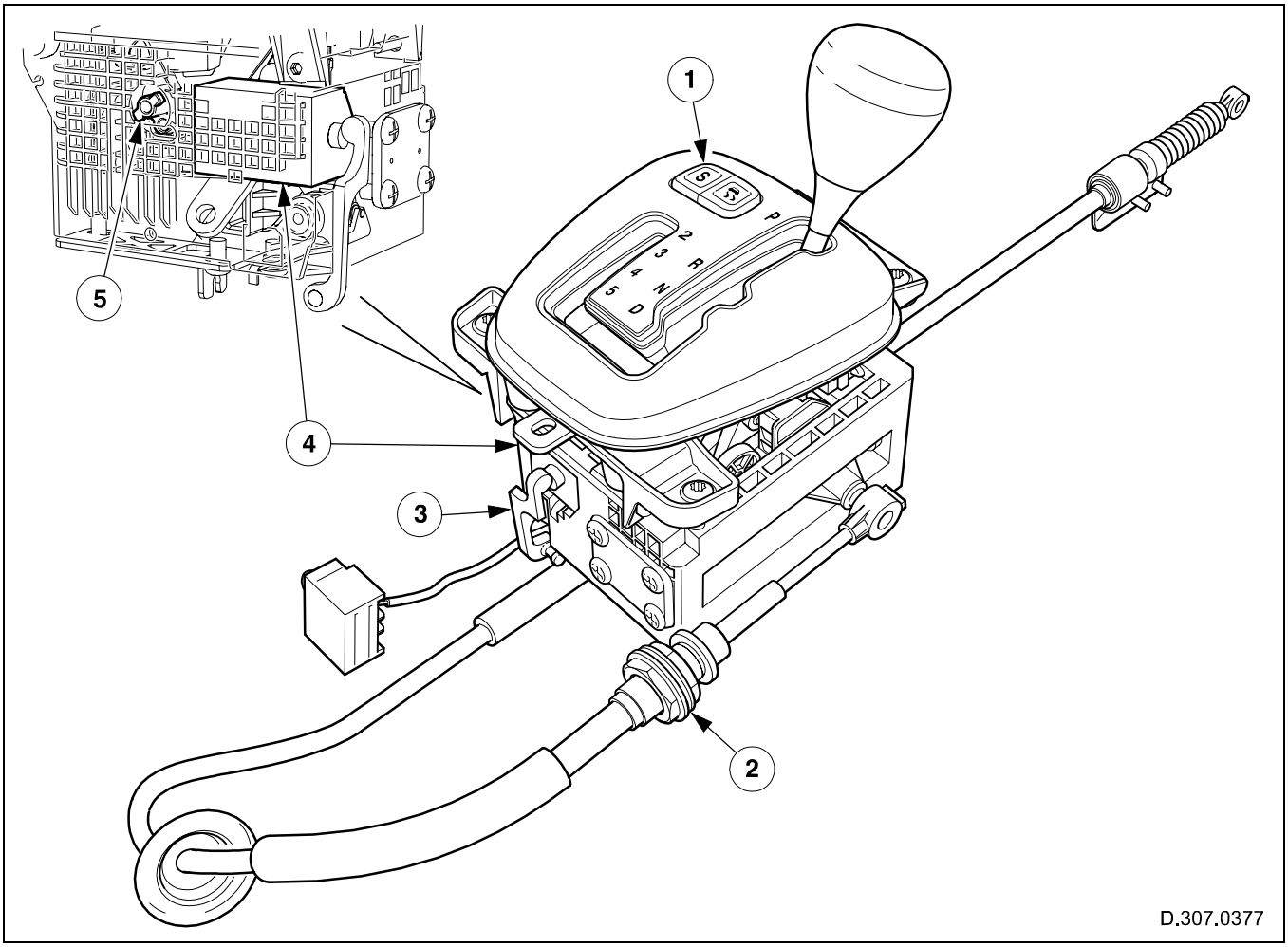


Fig. 66 Transmission selector mechanism and cable

1. Sports mode switch
2. Cable adjustment mechanism
3. Selector interlock mechanism
4. Selector interlock solenoid
5. Selector interlock override

J-gate

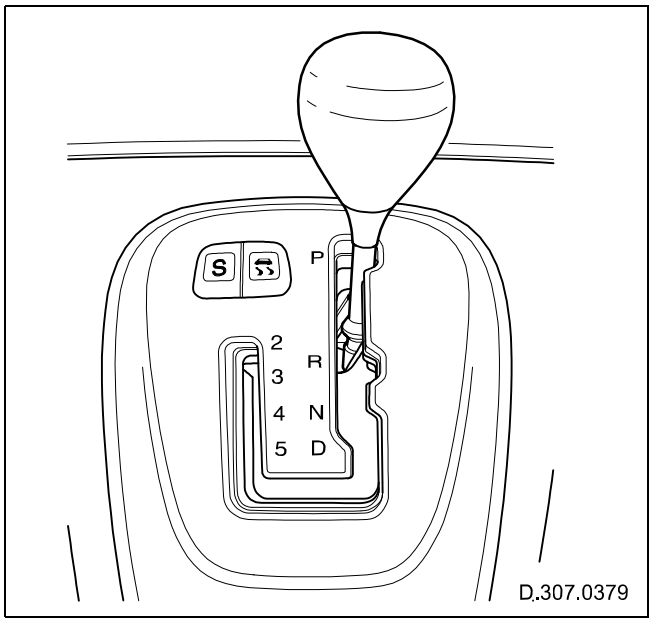


Fig. 67 J-gate selector positions

The J-gate is designed to accommodate either automatic or manual driving techniques:

- Automatic, right-hand side of the J-gate:
  - Enables selection of park 'P' through to drive 'D'.
  - The link between the selector lever and the transmission is via a cable.
  - A position switch within the transmission informs the transmission control module (TCM) of gear selection.
  - The TCM transmits gear selection information to other vehicle modules via the CAN.
  - With drive 'D' selected, gear selection is controlled by the TCM in response to signals received relating to vehicle status, for example throttle position, vehicle speed, etc. These signals are received via the CAN.
  - In addition, when 'D' is selected and sixth gear is engaged, the selector lever can be shifted sideways across the gate to fifth gear. Sixth gear will be inhibited until the selector lever is moved back to 'D'.
- Manual, left-hand side of the J-gate:
  - Enables individual selection of second, third, fourth and fifth gears.
  - The TCM detects the driver's gear selection through signals transmitted from the selector mechanism, via the CAN.

The sports mode switch, marked 'S' on the J-gate surround enables the driver to select either normal 'N' or sport 'S' modes. For further information on gear selection and sports mode switch, refer to **Automatic Transmission**.

Selector Interlock

The selector interlock is solenoid-operated; refer to **Fig. 66**. Its function, is to prevent the selector lever being moved from park 'P' until the ignition is 'ON' and the brake pedal is depressed. The solenoid remains in a de-energized state until the brake pedal is depressed.

NOTE: If the brake pedal is depressed while the ignition is switched 'ON' the position 'P' on the J-gate will flash. This indicates to the driver that the brake pedal must be released and then depressed to enable the selector lever to be moved out of park 'P'.

NOTE: If the selector lever is moved into park 'P' when the driver is simultaneously operating the brake pedal, the position 'P' on the J-gate will flash. This indicates to the driver that the brake pedal must be released and then depressed to enable the selector lever to be moved out of park 'P'.

Selector Interlock Override

In the event of a discharged or disconnected battery a provision is made to manually override the selector interlock solenoid enabling the selector lever to be moved from the park 'P' position. The interlock override is accessed by removing the top cover of the J-gate; refer to 'JTIS'.

Key Interlock

The key interlock system prevents the removal of the ignition key when the gear-shift lever is not in the park 'P' position.

- ROW vehicles: The park-switch incorporated in the selector mechanism functions the key interlock solenoid located in the ignition barrel to prevent the removal of the ignition key.
- NAS vehicles: The key interlock system is functioned by a cable operated mechanism to prevent the removal of the ignition key.

Limp Home Mode

In the event of an electrical or mechanical malfunction, the selector ranges on the right-hand side of the J-gate will still function; refer to **Automatic Transmission**. The selector mechanism performs its own internal fault monitoring and relays any fault codes to the TCM for diagnosis using 'WDS'.

Exhaust System

The exhaust system on the New XJ is constructed of stainless steel with polished tail-pipe sleeves, which are detachable. The system meets specific flow-resistance requirements and general engine conditions of each XJ powertrain variant.

Exhaust system performance is optimized with the introduction of thin-wall high-cell-density substrates to increase geometric surface-area and minimize backpressure. A low-weight exhaust system on the normally aspirated vehicle has revised resonator internals to optimize noise quality. The resonators on the supercharged variant are tuned to provide low backpressure and optimum sound quality.

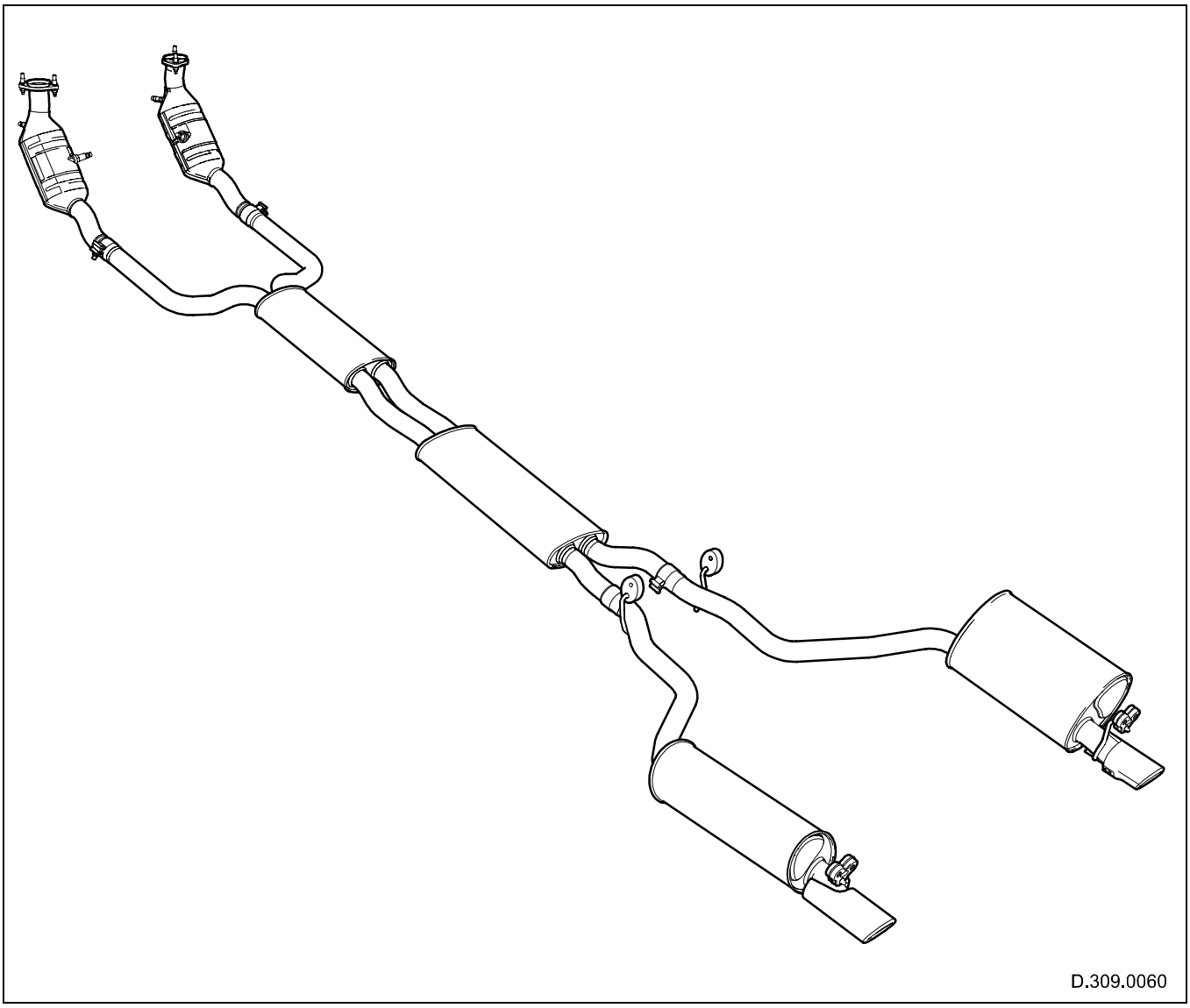


Fig. 68 Exhaust system - V8 Supercharged variant shown

Exhaust system tuning for each engine variant are as follows:

- The V8 normally aspirated system has 2 x 44 in^3 catalyst bricks in each down pipe, the front having 900 cells/in^2 and the rear 400 cells/in^2.
- The V8 supercharged system has 2 x 44 in^3 catalyst bricks in each down pipe, the front and rear bricks both having 600 cells/in^2.
- The V6 system has 2 x 44 in^3 catalyst bricks in each down pipe, the front and rear bricks both having 600 cells/in^2.
- The internals of the rear mufflers are different for each powertrain variant to achieve a different sound quality.

The entire exhaust system is assembled as follows:

- Two-bolt flanges, which are self-sealing, connect the two down-pipe catalyst assemblies to the exhaust manifolds.
- The resonator assembly attaches to the two down pipes and is secured by clamps. The two mufflers connect to the rear of the resonator assembly and are also secured by clamps.
- Four isolator rubbers support the exhaust system: two at the front of the muffler assembly and two at the tailpipe end.

Fuel Tank and Lines

Introduction

The XJ Range features a new fuel system incorporating a saddle tank positioned underneath the vehicle. A single fuel-pump located inside the tank on normally aspirated vehicles, provides optimal fuel-delivery performance. The flow-rate requirement of supercharged vehicle is achieved by the employment of a twin-pump fuel delivery system. The addition of an electronic returnless fuel system is also a further enhancement to the system.

Key Data

- Fuel tank capacity:
  - normally aspirated 85 liters (18.7 gallons),
  - supercharged 84.5 liters (18.6 gallons).
- Fuel rail pressure: 3.8 - 5.0 bar referenced to inlet manifold pressure.
- Maximum fuel flow - normally aspirated: 120 liters/hour at 3.8 bar (to atmosphere).
- Maximum fuel flow - supercharged: 180 liters/hour at 4.8 bar (to atmosphere).

Fuel Tank

To optimize luggage compartment capacity the fuel tank is now positioned underneath the vehicle, below the rear seat. This positioning necessitated the installation of a saddle tank to allow the vehicle's driveshaft to pass through the arch of tank. The tank is constructed of high-density polyethylene and is retained by two metal straps attached to the vehicle's underbody. A heat shield fitted to the underside of the tank isolates the tank from exhaust heat.

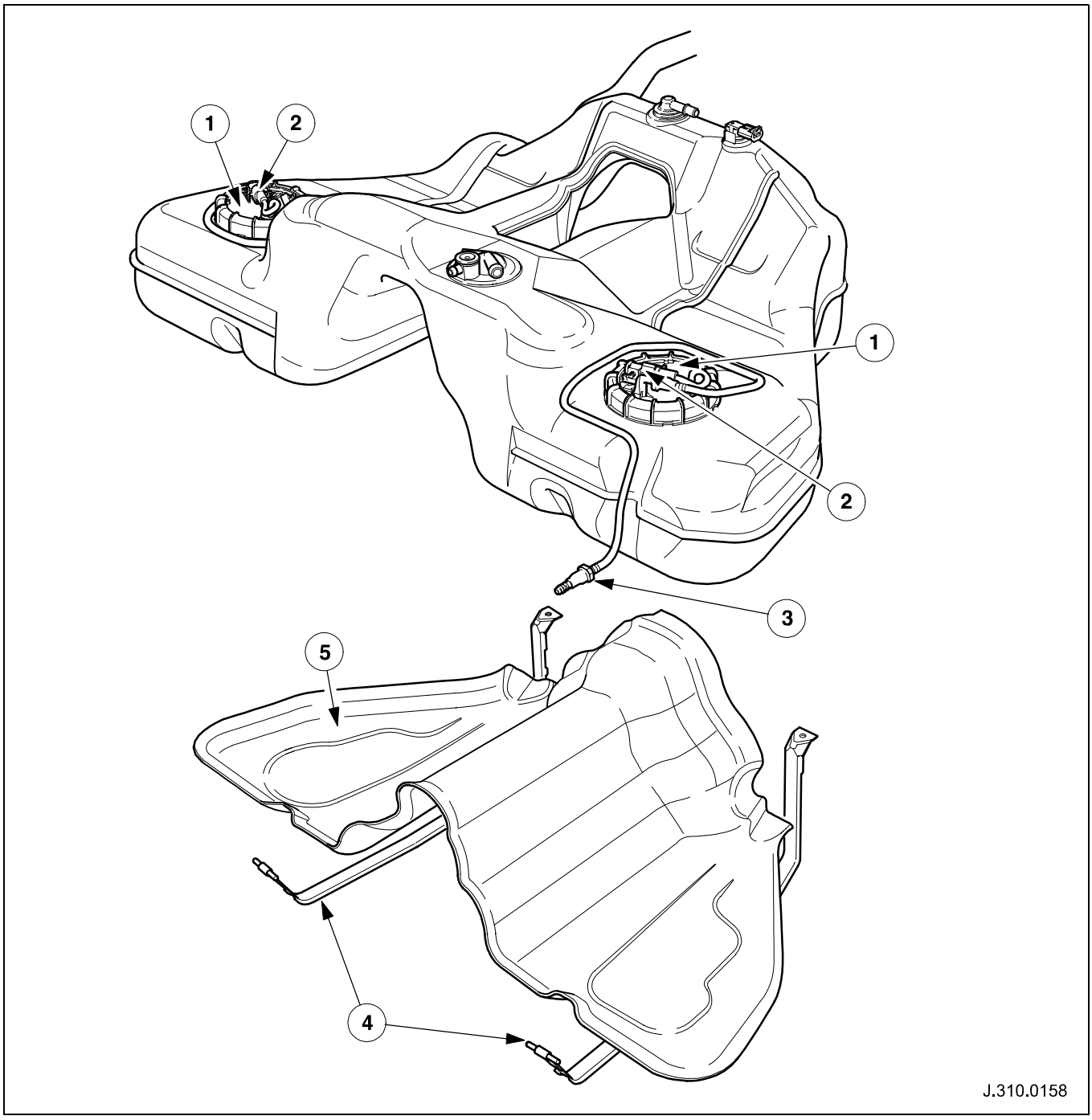


Fig. 69 Fuel tank - supercharged application shown

1. Fuel pump
2. Fuel pump and fuel level sensor, electrical connector
3. Fuel delivery line
4. Fuel tank retaining straps
5. Heat shield

Fuel Delivery - Normally Aspirated Vehicles

The fuel pump is a variable-speed rotary-vane type, which operates in a fuel module located in the right-hand fuel tank compartment. A fuel transfer module is located in the left-hand compartment; refer to **Fig. 70**. Both components are secured by screw-on plastic closure rings and have integral top plates for external line-work and electrical connectors.

The fuel delivery line connects to the module on the right-hand-side of the tank. The line has a revised diameter and route, with the fuel filter situated underneath the vehicle's floor on the left-hand side of the vehicle.

Fuel is maintained at an equal level between the fuel tank compartments by circulating the fuel through internal crossover lines via suction jet-pumps. High-pressure fuel from the fuel pump is directed through the jet-pump's orifice, creating a low-pressure area to be formed around the orifice. Fuel is drawn into this low-pressure area and directed into the crossover line to the opposing module.

Fuel is pumped from the fuel pump to the fuel rail via the parallel pressure relief valve and fuel filter. The parallel pressure relief valve contains two spring-loaded valves, which operate in opposite directions. The function of the valve is to:

- Assist engine starting by retaining a pre-set fuel pressure in the fuel delivery line and fuel rail.
- Limit fuel-rail pressure due to temporary vapor increase in hot conditions.
- Limit fuel-rail pressure caused by sudden load changes for example, a fully open to closed throttle transition.
- Prevent leakage from the tank in the event that the fuel delivery line is severed.

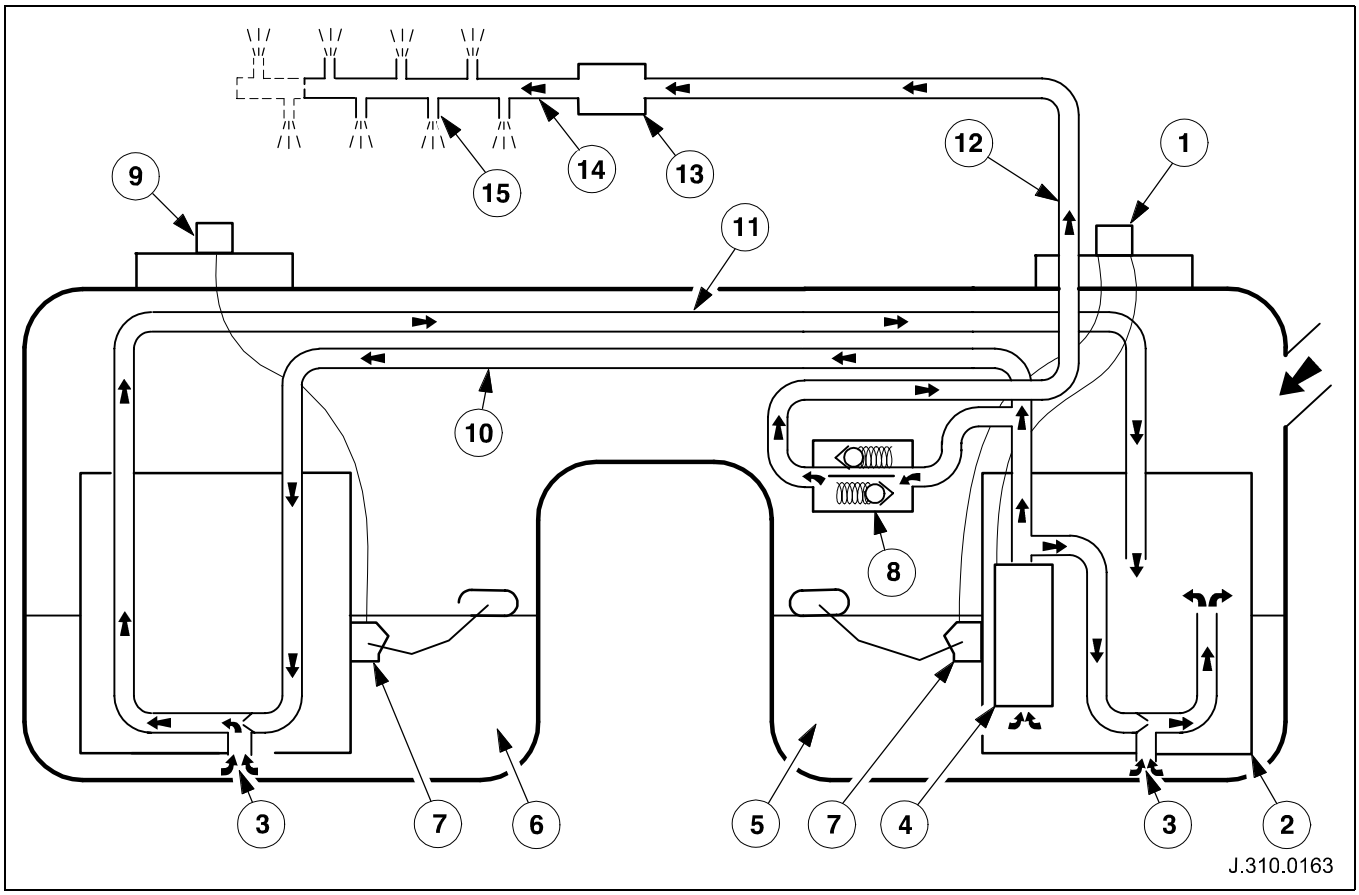


Fig. 70 Schematic of fuel tank internals - normally aspirated application

1. Fuel pump and fuel level sensor, electrical connector
2. Fuel pump module
3. Suction jet-pump
4. Fuel pump
5. Right-hand fuel compartment
6. Left-hand fuel compartment
7. Fuel level sensor
8. Parallel pressure relief valve
9. Fuel level sensor, electrical connector
10. High-pressure crossover circulation line
11. Low-pressure crossover circulation line
12. Engine fuel-delivery line
13. Fuel filter
14. Fuel rail
15. Fuel injector

Fuel Delivery - Supercharged Vehicles

The twin Gerotor fuel pumps are high-performance variable-speed types, with each pump operating in a fuel module located in each fuel tank compartment; refer to **Fig. 71**. The pumps are secured by screw-on plastic closure rings and have integral top plates for external line-work and electrical connectors.

The fuel delivery line connects to the module on the left-hand-side of the tank. The line has a revised diameter and route, with the fuel filter situated underneath the vehicle's floor on the left-hand side of the vehicle.

Fuel is maintained at an equal level between the fuel tank compartments by circulating the fuel through internal crossover lines via suction jet-pumps. High-pressure fuel from the fuel pumps is directed through the jet-pump's orifice, creating a low-pressure area to be formed around the orifice. Fuel is drawn into this low-pressure area and directed into the crossover lines to the opposing module.

Fuel is pumped from the fuel pump to the fuel rail via the parallel pressure relief valves and a fuel filter. Each parallel pressure relief valve contains two spring-loaded valves, which operate in opposite directions. The function of the valves is to:

- Assist engine starting by retaining a pre-set fuel pressure in the fuel supply line and fuel rail.
- Limit fuel-rail pressure due to temporary vapor increase in hot conditions.
- Limit fuel-rail pressure caused by sudden load changes for example, a fully open to closed throttle transition.
- Prevent leakage from the tank in the event that the fuel delivery line is severed.

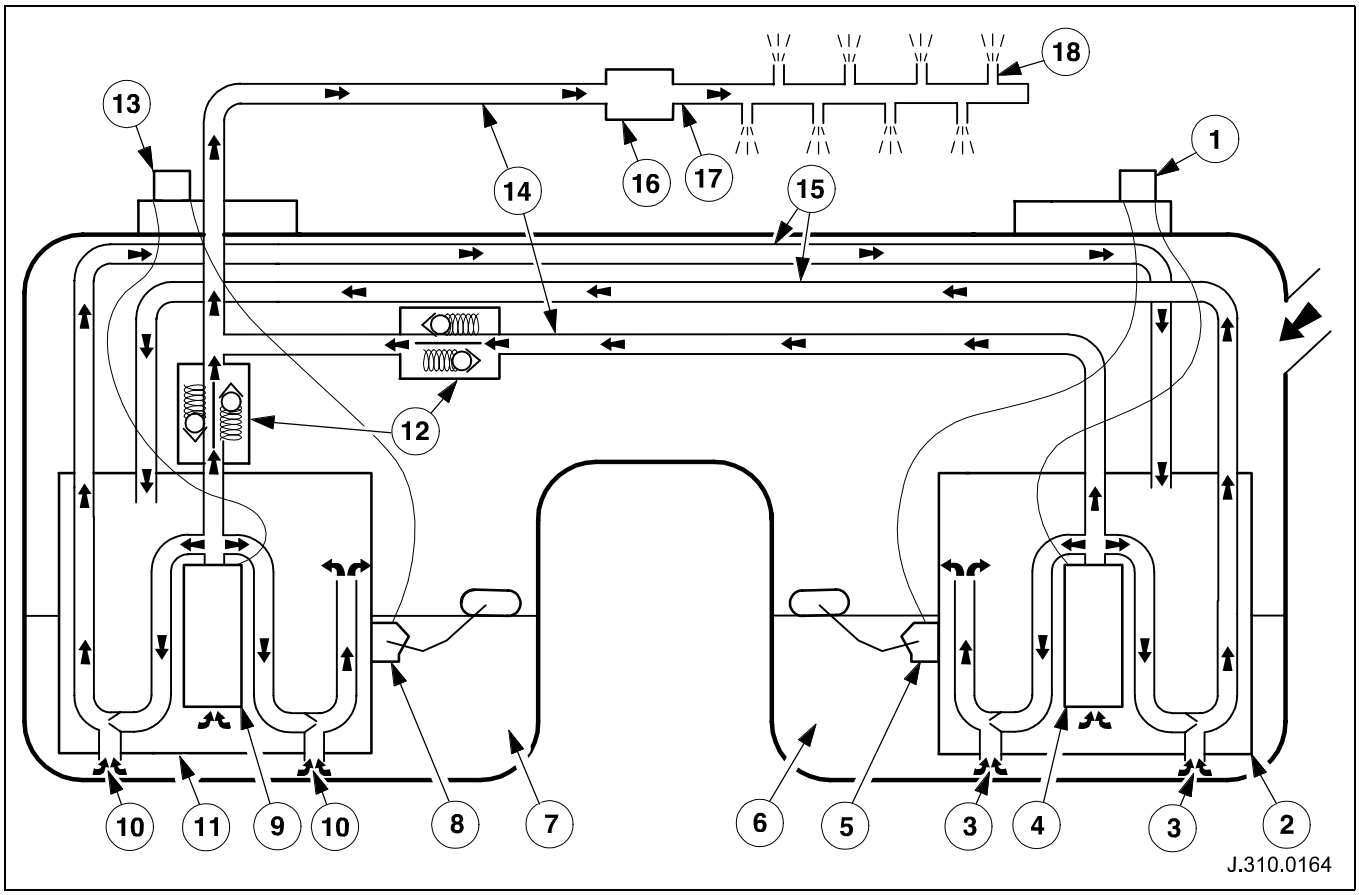


Fig. 71 Schematic of fuel tank internals - supercharged application

1. Fuel pump and fuel level sensor, electrical connector
2. Fuel pump module
3. Suction jet-pump
4. Fuel pump
5. Fuel level sensor
6. Right-hand fuel compartment
7. Left-hand fuel compartment
8. Fuel level sensor
9. Fuel pump
10. Suction jet-pump
11. Fuel pump module
12. Parallel pressure relief valve
13. Fuel pump and fuel level sensor, electrical connector
14. Engine fuel-delivery line
15. Low-pressure crossover line
16. Fuel filter
17. Fuel rail
18. Fuel injector

Returnless Fuel System

The returnless fuel system supplies the correct amount of fuel as required by the engine at any given moment. This eliminates the requirement of excess fuel returning to the fuel tank.

The benefits of the returnless fuel system are listed below:

- reduces load on the electrical system;
- improves fuel economy;
- eliminates the effects of fuel pressurization and depressurization;
- eliminates the effects of engine-heat causing extra fuel vapor being generated in the fuel tank by returning fuel.

Normally Aspirated Vehicles

The fuel pump module (FP module), via pulse-width modulated signals from the ECM, controls the amount of fuel supplied by the fuel pump to the fuel rail. The ECM receives signals from the fuel pressure sensor and fuel temperature sensor, located on the fuel rail, to indicate the pressure of the fuel in the fuel rail. In response to these signals, plus other engine and driver demand signals, the ECM calculates the amount of fuel required and requests the FP module to vary the fuel pump delivery to suit the engine's requirements.

- The fuel pump module is integrated into the rear electronic module (REM), located in the right-hand side of the luggage compartment.

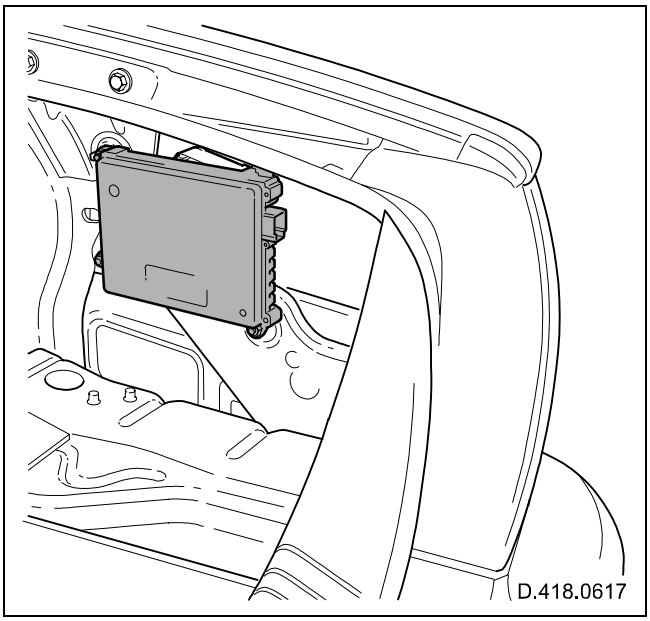


Fig. 72 Fuel pump module (integral to rear electronic module)

Supercharged Vehicles

The supercharged engine's fuel system works on the same principal as the normally aspirated system, however to meet the fuel flow-rate requirements of the supercharged engine, the fuel tank incorporates two fuel pumps, which operate simultaneously; refer to **Fig. 71**. The right-hand fuel pump is controlled by the FP module integrated into the REM, via signals from the ECM. A secondary FP module, also via signals from the ECM controls the left-hand fuel pump.

- The secondary FP module is located in the right-hand side of the luggage compartment, behind the REM.

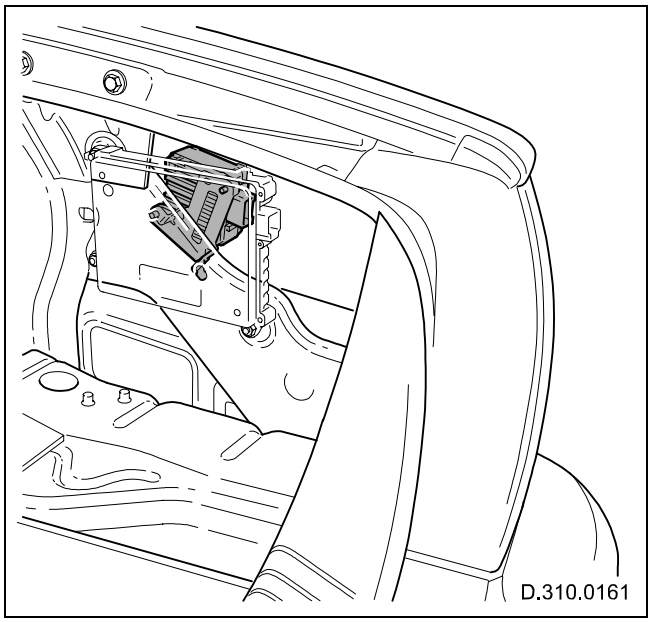


Fig. 73 Secondary fuel pump module - supercharged

Fuel Tank Level Monitoring

Each fuel tank compartment incorporates an independent fuel level sensor. Signals from each sensor are calculated by the REM and then relayed to the instrument cluster. The total quantity of fuel in the tank is displayed on the fuel gauge. A low-fuel warning light is also displayed on the fuel gauge face.

Inertia Fuel Shutoff Switch

In the event of an accident, the inertia fuel shutoff switch may trip, (depending on the severity and type of impact), isolating the fuel pump operation. Once the switch has tripped it must be reset before attempting to restart the engine.

The switch is located behind the trim on the left-hand side of the vehicle, forward of the front door post, below the fascia. A finger access hole in the trim allows access to reset the switch.

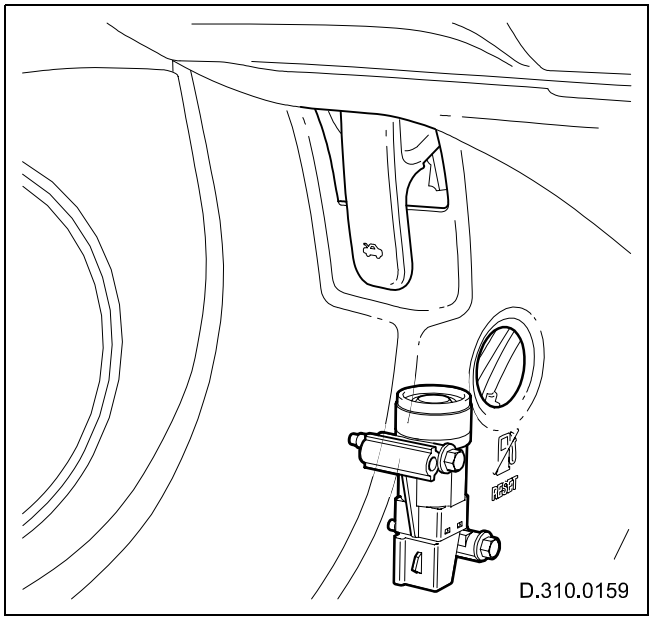


Fig. 74 Inertia fuel shutoff switch

Resetting the Switch

WARNING: To avoid the possibility of fire or personal injury, do not reset the inertia switch if you see or smell fuel.

If no fuel leaks are apparent, reset the inertia switch as follows:

1. Turn the ignition switch to position '0'.
2. Press down the rubber reset button on top of the inertia switch.
3. Turn the ignition switch to position 'II', pause for two seconds, then return the key to position '0'.
4. Make a further check for fuel leaks.

Climate Control System

NOTE: Specific climate control features will vary depending on both vehicle and market specification.

The climate control system provides filtered air to the passenger compartment from a fully automatic, temperature controlled system.

A 2-zone system is installed as standard and provides dual automatic distribution as a default, where:

- Driver and front passenger can independently control the passenger-compartment air temperature for their individual comfort.
- Mode selections such as face, face/floor, floor and defrost are automatic and also independent from side-to-side.

NOTE: The automatic mode selection reflects the temperature set (Tset) from side-to-side.

- Default operation for the Tset is: the passenger side Tset follows the driver Tset. The 'Dual' operation indicator remains extinguished.
- Changes to the passenger Tset will illuminate the 'Dual' indicator, confirming the Tset for each side can be chosen independently.
- Should the passenger Tset be different to the driver Tset and that situation is no longer desirable (the passenger has vacated the vehicle), selecting 'Dual' extinguishes the indicator and synchronizes the passenger side temperature with the driver side Tset (returns the operation of the system to the default).

A 4-zone system is available as an optional installation. The additional two zones, refers to the passenger compartment area behind the front seats.

Independent control of the temperature in the two rear zones can be achieved using the rear climate control panel or using the touch-screen (where fitted); refer to **Rear Climate Control System**.

NOTE: The climate control system will also respond to spoken commands if the optional voice control system is fitted; refer to **Voice Activated Control System**.

The system is designed to provide efficient regulation of the vehicle environment without intervention from the occupant(s). Sensors inside the vehicle, monitor temperature, humidity and direct sunlight. In response, the electronic control system automatically adjusts the heat input, blower speed, air intake and air flow distribution to reduce misting and maintain the selected temperature(s).

NOTE: All windows and the closing roof panel should be closed before automatic operation is selected, in order to provide optimum comfort under most driving conditions.

Major Differences

When compared to the previous XJ range of vehicles, the new XJ has the following major differences:

- No water control valve;
- Re-introduction of air blend doors;
- Side-to-side automatic temperature control;
- Side-to-side air flow distribution;
- Variable displacement compressor (no magnetic clutch);
- Condenser with integral receiver-drier.
- Air intake filter;
- Single blower.

Display and User Controls

Control Panel With LCD

The climate control functions are selected by push buttons and a rotary control. When a function button is pressed, selection is confirmed by a 'beep' and illumination of the tell-tale LED.

NOTE: In manual mode, the LCD uses graphic symbols to provide confirmation of the system status.

The LCD in figure **Fig. 81** shows a range of symbols and messages that could be displayed; it is for guidance only.

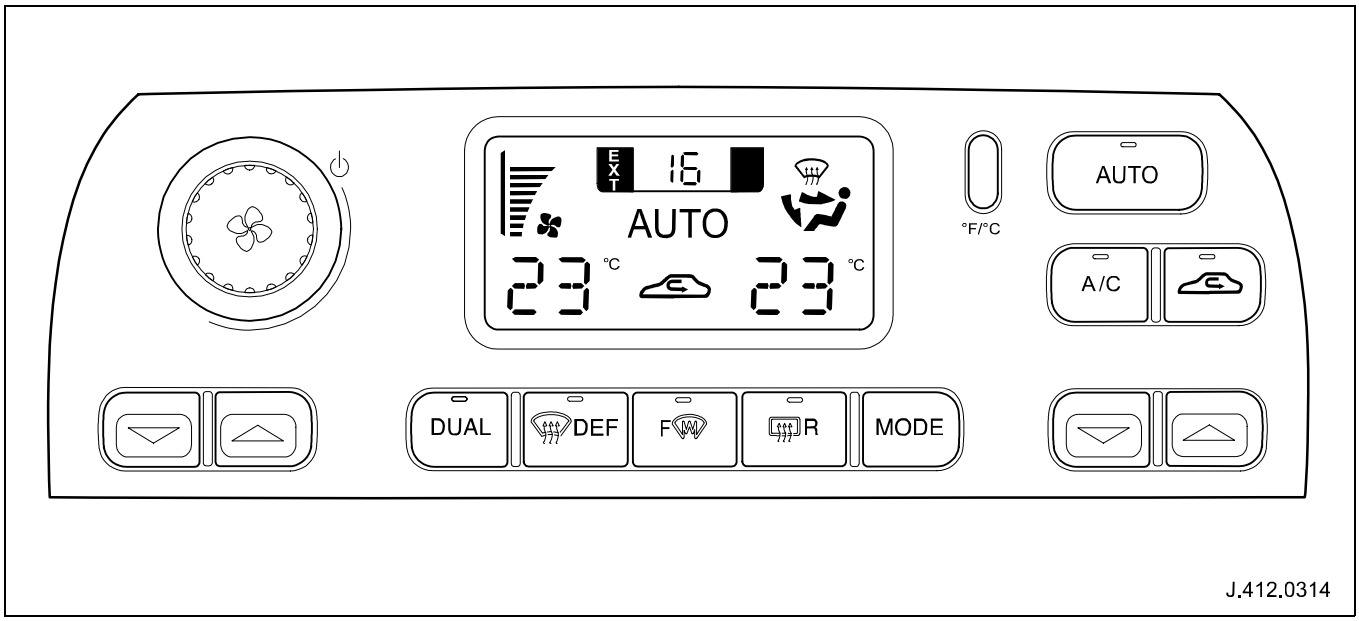


Fig. 75 Control panel with LCD (heated front screen option)

Control Panel with Touch-screen

The control panel with touch-screen is a multifunction touch-screen console which comprises on-screen simulated buttons (soft buttons) and perimeter buttons (hard buttons); refer to **Telematics** for further information.

Selecting 'Options' will cause a different screen to be displayed. From the available options, front seat occupants (subject to market and vehicle specification) may choose:

- 'Adjust settings' for the rear climate control system.
- 'Match' the rear system settings to those chosen by the driver.
- 'Lock' the rear control panel so that rear seat occupants are unable to change any settings.
- °C or °F as default unit of measurement.
- Smog sensitivity level (where applicable).

Temperature LCD

When the climate control system is operational, the small, integral LCD, located below the touch-screen, provides confirmation of:

- external (EXT) ambient temperature;
- required interior temperature (selected by the driver);
- required interior temperature (selected by the passenger).

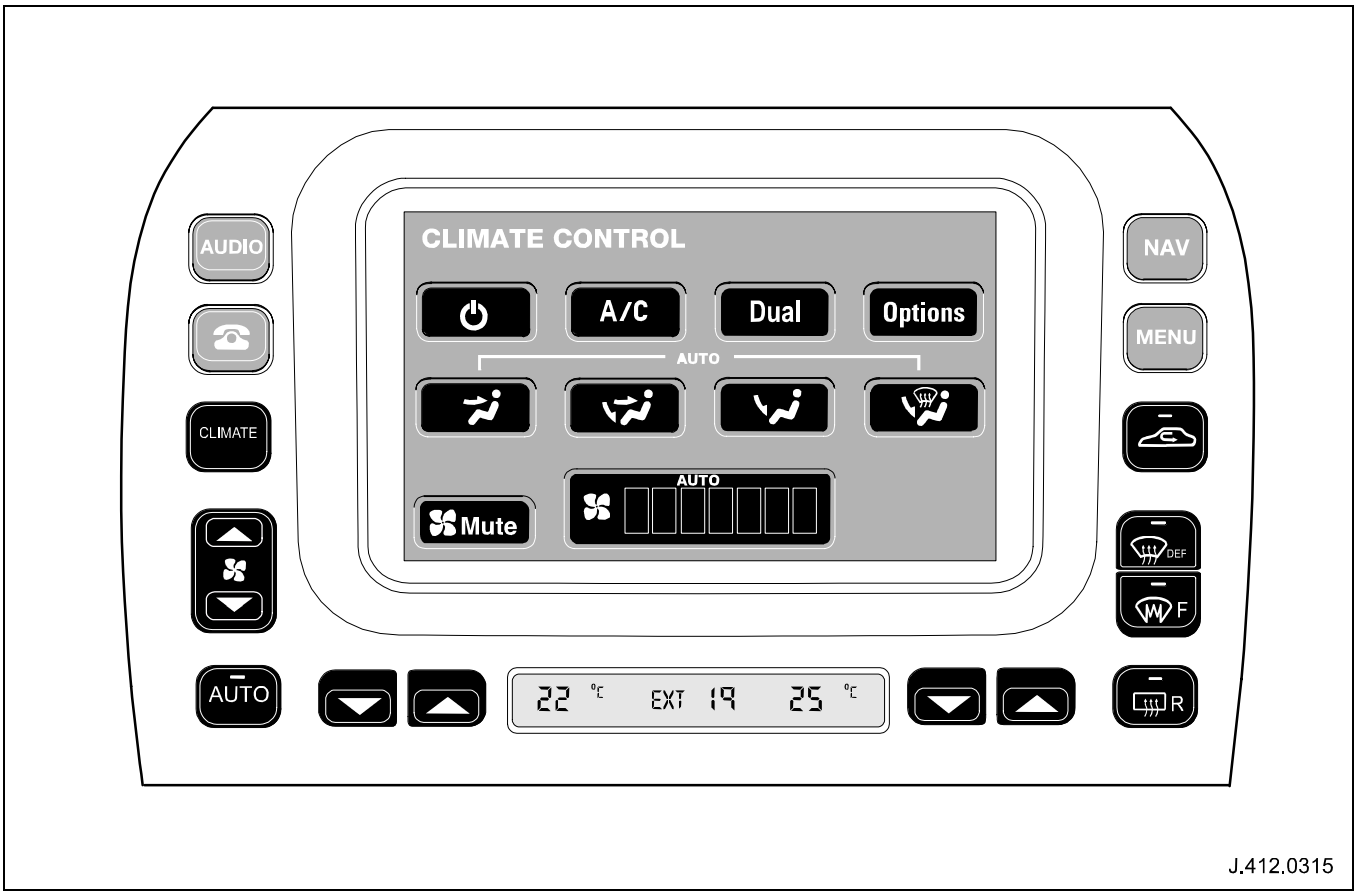


Fig. 76 Climate control buttons

Automatic Climate Control

The automatic climate control system comprises:

- Control panel with LCD or touch-screen control panel (telematics display module).
- Climate control assembly; refer to **Heating and Ventilation**.
- Air conditioning components; refer to **Air Conditioning**.
- Discrete sensors; refer to **Control Components**.
- Climate control module; refer to **Control Components**.

System Features

Following reconnection of the battery and with the ignition key at position 'II', the climate control system will default to 'OFF' but with a stored value of 23°C.

In circumstances when the display shows either 'HI' or 'LO' instead of a value, the default value can be established by 'pressing and holding' the 'AUTO' button for 2 seconds.

When the ignition key is turned to position '0' or removed from the ignition, the system (depending on conditions) may set the air distribution doors to a predetermined configuration after 120 seconds.

Defrost

Selecting defrost 'DEF' automatically selects 'A/C'and:

- deactivates timed or latched air-recirculation (a condition which cannot be reversed while the system is in this mode);

NOTE: Selecting 'AUTO' or 'DEF' cancels the condition.

- Activates heated front and rear screens (where fitted).

Recirculated and fresh air

NOTE: Timed or latched recirculation are not available when 'DEF' has been selected.

When automatic control (AUTO) is selected, as part of a complex strategy to prevent window-misting and improve occupant comfort, the fresh-air intake door is controlled automatically. In addition, the intake door can also be controlled manually in the following manner:

Timed air-recirculation

'Briefly pressing' the recirculation button engages the recirculation feature for a period of time that will vary depending on climatic conditions and is specifically designed to prevent 'misting'.

- The tell-tale LED will remain illuminated and extinguish after the time-out period has elapsed.

NOTE: The telematics screen (where fitted) confirms the status by displaying a timed recirculation symbol.

Latched air-recirculation

'Pressing and holding' the recirculation button for 2 seconds, latches the recirculation feature (does not time-out). Latched air-recirculation is confirmed by:

- a screen symbol;
- an audible 'double beep'.

NOTE: When latched recirculation has been selected, to reduce condensation, the air conditioning will operate automatically.

Latched fresh air

Pressing the recirculation button when the recirculation LED is illuminated, closes the recirculation door and sends the system to the latched fresh-air condition.

NOTE: Smog sensor operation (where applicable) is automatically cancelled.

Pressing the 'AUTO' button returns the recirculation door to normal, automatic operation.

NOTE: Timed recirculation, latched recirculation and latched fresh air modes are cancelled when the ignition key is turned to position '0'.

Electrical Connections

Refer to **New XJ Range Electrical Guide** for detailed connection information between climate control components

Diagnostics

The climate control system:

- constantly monitors the status of the system;
- where appropriate, stores a DTC within the climate control module for analysis using WDS.

Air Distribution and Filtering

Air distribution and filtering is achieved using the following:

- Combination filter.
- Instrument panel registers.
- Footwell ducting.
- Defrost ducting.
- Defrost and cool-air bypass doors (driver and passenger).
- Floor/face doors (driver and passenger).
- Temperature blend doors (driver and passenger).
- Recirculation door.
- Rear floor-ducting.
- Rear face-ducting.

NOTE: Vehicles installed with the rear climate control system (RCCS) do not utilize the rear face-ducting, which is terminated at the climate control assembly. The RCCS uses direct ducting; refer to **Floor Console**.

The combination filter provides particle filtration and in addition minimizes odors entering the vehicle via the air distribution system.

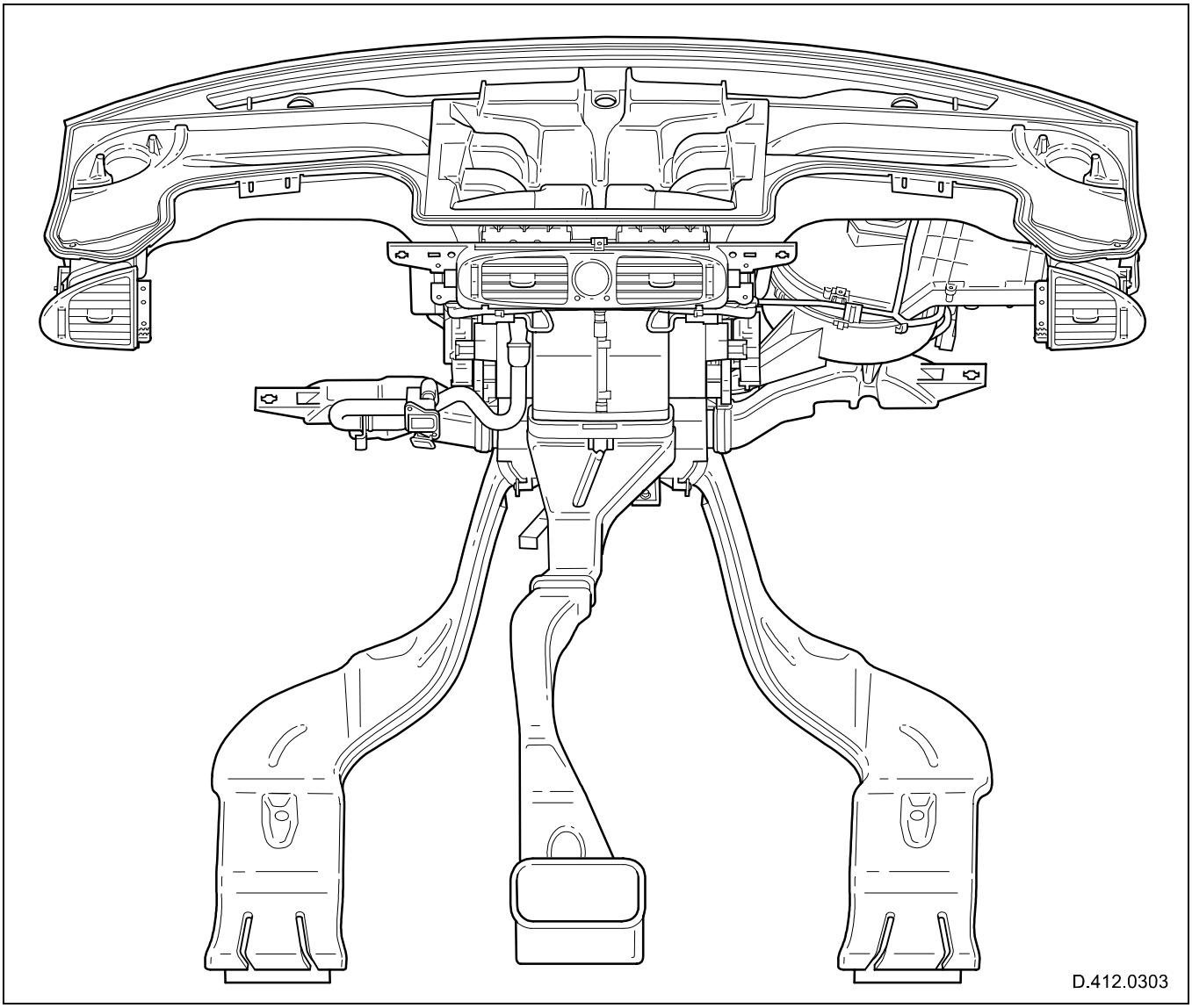


Fig. 77 Air distribution and filtering (2-zone)

Heating and Ventilation

Heating and ventilation is determined by the climate control assembly which comprises the following:

- Evaporator core; refer to **Air Conditioning**.
- Heater core.
- Auxiliary coolant pump (not installed for V6 2-zone climate control variant).
- Blower and blower speed module.
- Door actuators; refer to **Control Components**.
- Airflow doors; refer to **Air Distribution and Filtering**.
- Evaporator and discharge sensors; refer to **Control Components**.

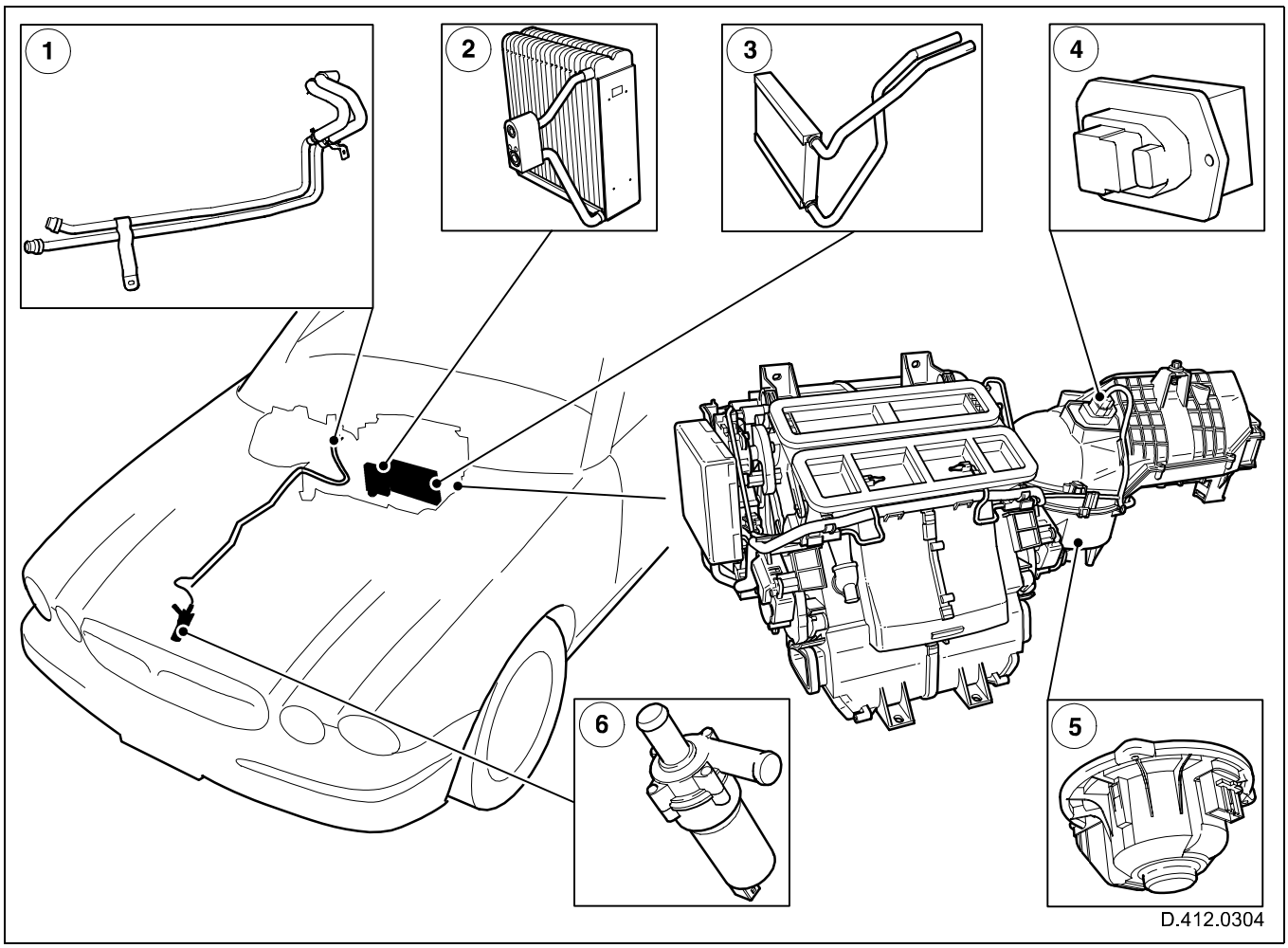


Fig. 78 Heating and ventilation components

1. Heater hose assembly
2. Evaporator core
3. Heater core
4. Blower speed module
5. Blower motor
6. Auxiliary coolant pump (not V6 2-zone)

Heater Core

The single heater core is located within the climate control assembly and connected via the heater pipes to the engine cooling system; refer to **Powertrain**, **Engine Cooling**.

Auxiliary Coolant Pump

Also part of the engine cooling system, the auxiliary coolant pump is located at the radiator and cooling fan assembly and controlled via the blower motor relay, by the CCM.

Blower

The blower is driven by a d.c. motor. The motor receives battery voltage via the blower motor relay, as determined by the CCM. The motor speed is determined by the blower speed module.

Blower Speed Module

The blower speed module determines the blower motor speed depending on the signal received from the CCM. If 'AUTO' mode is selected, the speed module responds to the CCM, by selecting an appropriate output voltage. The difference between that voltage and the battery voltage determines the voltage across the motor and hence its speed. One of up to 32 different voltage levels can be chosen by the module.

The motor speed (which can also be controlled manually) is visually indicated by display segments:

- 1 to 11 for the climate control panel with LCD.
- 1 to 7 for the telematics display version.

NOTE: Until the engine coolant temperature has reached a predetermined level, the auto-blower control will only operate at low speed.

Heated Screens and Mirrors

Heater functionality is constantly monitored by the electrical load management system (ELMS); refer to **Electrical Load Management System**. The ELMS dictates that in circumstances where the generated electrical power is less than the electrical consumption, selected systems may be temporarily inhibited or operated for a reduced period of time if necessary.

NOTE: Tell-tale LEDs remain illuminated so that any corrective action is not apparent to the driver.

Heated front screen

Depending on vehicle specification, the heated front screen (HFS) may incorporate a fine-wire electrical grid for total heating, or a small grid in the area where the wipers park, only.

NOTE: The total heating option comprises two independent grids, one for the driver's side and one for the passenger side.

On receipt of a ground signal from the CCM, battery voltage is switched via separate relays to both sides of the screen. The heater elements will only be activated after data has been exchanged between the climate control module (CCM) and the engine control module (ECM):

- CCM sends request to ECM.
- ECM confirms or denies request.
- CCM activates the appropriate relay, provided the request has been confirmed.

As part of the continuous demisting strategy, when the ambient temperature is low, providing the power consumption is less than the generated power, the ELMS will permit the activation of the heated front screen to prevent the possibility of misting.

NOTE: The tell-tale LED will not illuminate so that the action is not apparent to the driver.

The heated front screen (where fitted) is automatically selected when the engine is 'running' and the ambient temperature falls below 5°C.

NOTE: The tell-tale LED will illuminate.

Heated rear screen

On receipt of a ground signal from the CCM, battery voltage is switched via a relay, to the heated rear screen (HRS).

NOTE: The strategy for activating the heated rear screen is identical to the strategy for the HFS.

Heated exterior mirrors

The heated exterior mirrors are activated by the same relay as the heated rear screen but are separately fused.

Basic functionality

NOTE: Both heated screens will be activated automatically at temperatures below predetermined levels.

The heated rear screen and both exterior mirror heaters will operate when selected, provided the engine is running; operation will halt after 21 minutes or can be manually halted.

The heated front screen (if fitted), will operate when selected, provided the engine is running; operation will halt after 6.5 minutes or can be manually halted.

Heated Steering Wheel

The steering wheel heater, where installed, is activated when the driver's seat heater switch is operated. The switch provides an input to the front electronic module (FEM), which responds by supplying an output signal via the clockspring contacts to the heated steering wheel (HSW) electronics . The HSW electronics receives supply voltage via the power coupling and slip rings.

The HSW power coupling, which attaches to the clockspring, comprises two spring contacts that interface with the HSW electronics, to ensure power and ground connections are maintained.

The HSW electronics, controls the operation of the HSW element when appropriate, maintaining a surface temperature of approximately 30°C (86°F).

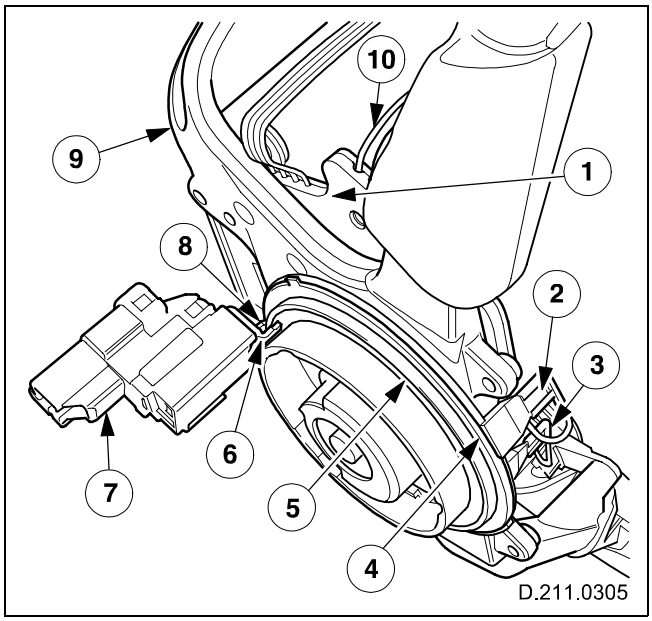


Fig. 79 Heated steering wheel connections

1. HSW electronics
2. Spade connector (positive)
3. Spade connector (negative)
4. Slip ring (positive)
5. Slip ring (negative)
6. Spring contact (negative)
7. Power coupling
8. Spring contact (positive)
9. Steering wheel armature
10. To HSW heater element

Air Conditioning

Air conditioning comprises the following system components:

- Evaporator core and thermal expansion valve.
- Compressor inlet line.
- Compressor.
- Condenser with integral receiver-drier.
- Condenser outlet line.
- Pressure transducer (part of compressor outlet line but serviceable separately).
- Combined evaporator intake/discharge line assembly with integral service ports.
- Compressor outlet line.

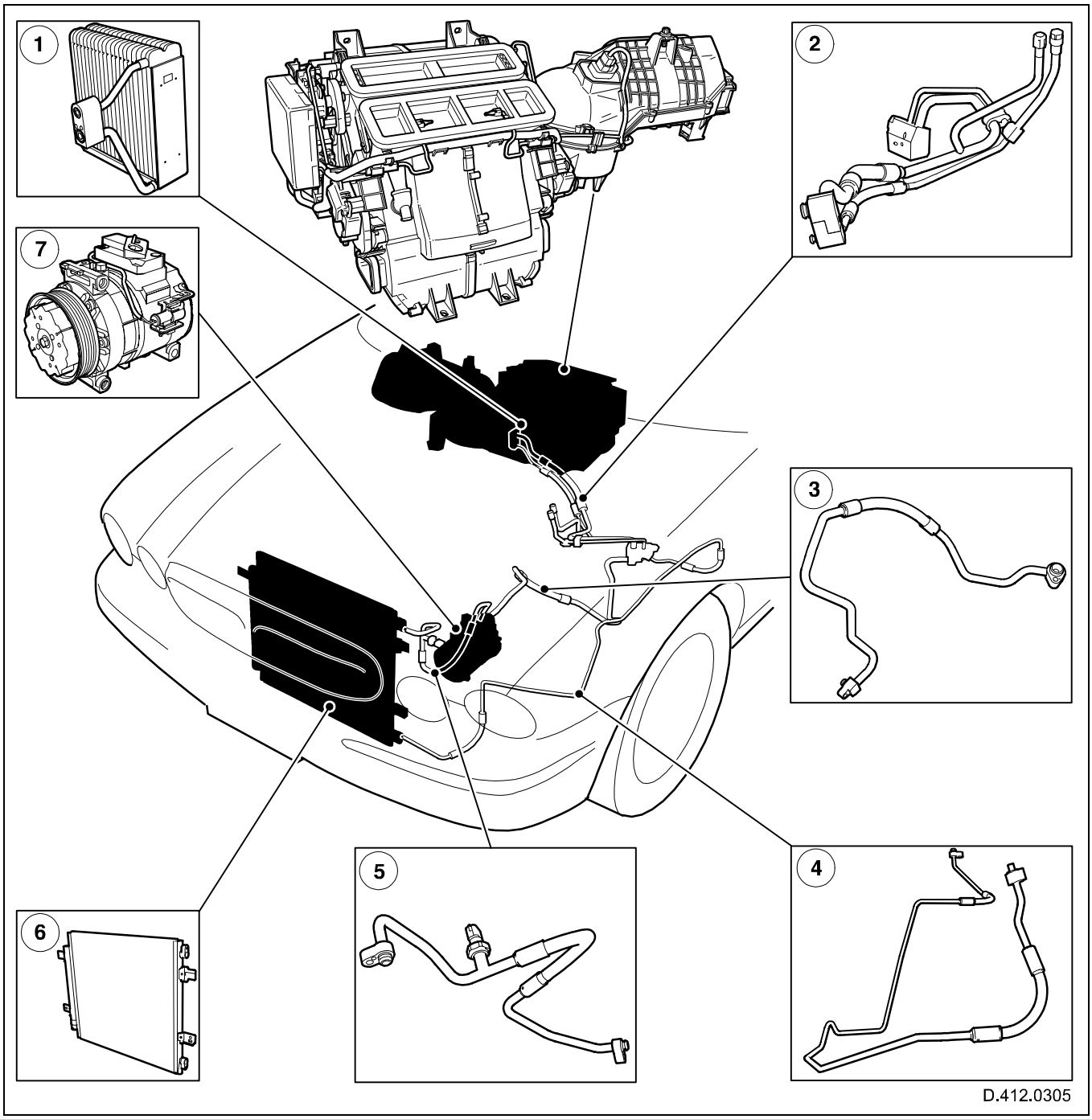


Fig. 80 Air conditioning components

1. Evaporator core and thermal expansion valve
2. Evaporator intake/discharge line assembly
3. Compressor inlet line
4. Condenser outlet line
5. Compressor outlet line
6. Condenser/receiver-drier
7. Compressor

Operation

With reference to **Fig. 81**:

- The compressor (6) is mounted directly to the engine and driven by the accessory drive belt. The compressor, compresses the low-pressure, gaseous refrigerant received from the evaporator core. The refrigerant is discharged from the compressor to the condenser/receiver-drier (4) as a high-pressure, high-temperature vapor.

NOTE: The manifold block of the compressor tube assembly incorporates a pressure relief valve.

- The condenser converts the high-pressure vapor to a liquid by utilizing the cooling effect of the air flowing over the condenser. The high-pressure warm liquid leaves the condenser, travels along the liquid line and enters the thermal expansion valve (2).
- The thermal expansion valve regulates the flow of refrigerant and causes a pressure reduction as it enters the evaporator core (1).
- The resultant reduction in pressures, causes the refrigerant to boil and removes heat and moisture from the air passing through the evaporator core into the passenger compartment. The heat transfer results in cool refrigerant vapor leaving the evaporator and returning to the compressor.

NOTE: Moisture from the atmosphere condenses on the fins of the evaporator before draining to the outside of the vehicle via the single, integrated condensate drain-tube.

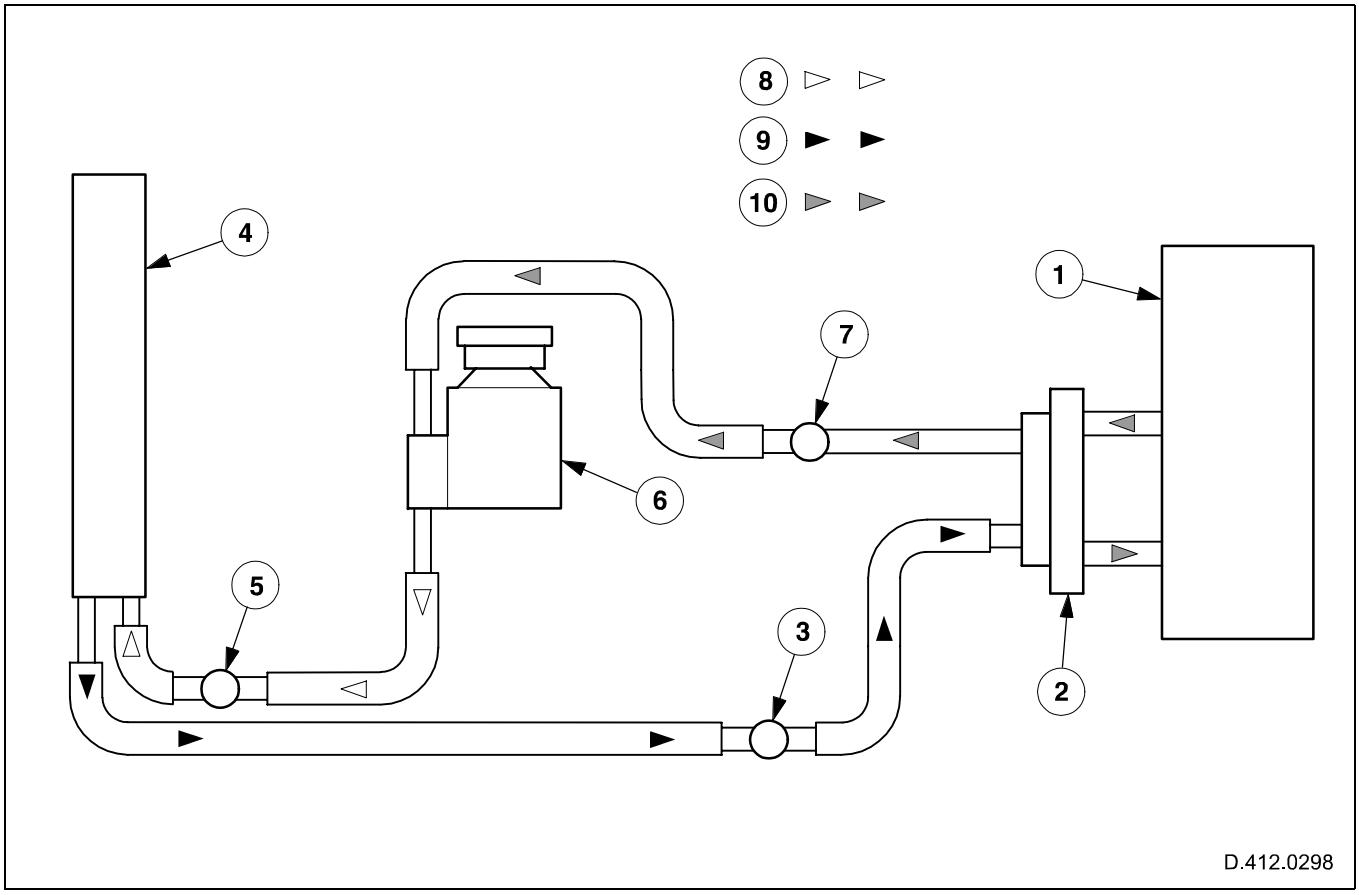


Fig. 81 Air-conditioning refrigerant flow (2–zone)

1. Evaporator core
2. Thermostatic expansion valve
3. High-side charge port
4. Condenser/receiver-drier
5. Pressure transducer
6. Compressor
7. Low-side charge port
8. High-pressure refrigerant (gaseous and hot)
9. High-pressure refrigerant (liquid and warm)
10. Low-pressure refrigerant (gaseous/liquid)

Compressor

The compressor installed is uniquely designed to suit the engine configuration and whether a 2-zone or a 4-zone climate control system is installed. The compressor does not have a magnetic clutch, instead, operation is continuous in response to a PWM signal supplied directly from the CCM to the compressor solenoid. Since there is no clutch cycling, the operation of the compressor is significantly quieter and more efficient as far as engine load is concerned. This type of compressor is capable of responding to smaller changes in system demands to accommodate requirements such as providing a 'chilling' effect without causing 'icing' of the evaporator.

Evaporator temperature

As part of an advanced automatic, evaporator temperature control, the evaporator temperature is controlled and varied by the CCM in response to parameters which include:

- Length of time the vehicle has been running.
- Ambient temperature.
- Passenger compartment temperature.
- Passenger compartment humidity.

NOTE: Selecting defrost automatically selects the air conditioning a condition which cannot be overridden while the system is in this mode.

Condenser/receiver-drier

The condenser and receiver-drier are integrated into a single unit, which incorporates a serviceable desiccant-sack.

Service ports

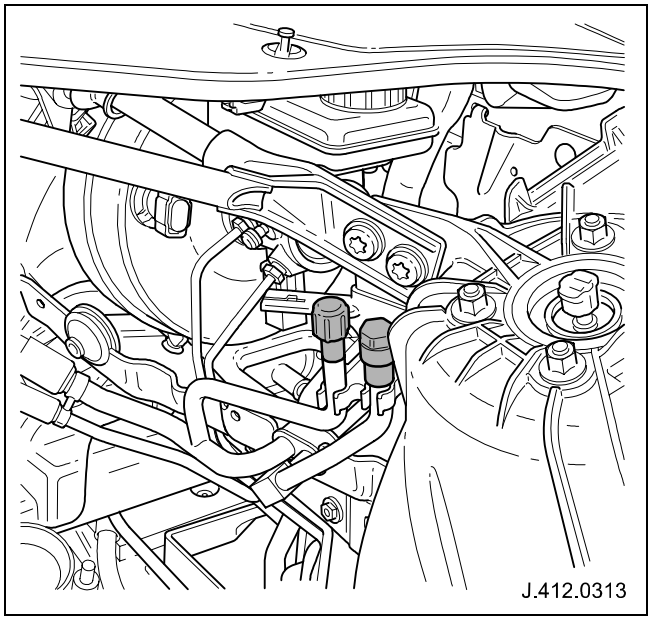


Fig. 82 Location of service ports

Control Components

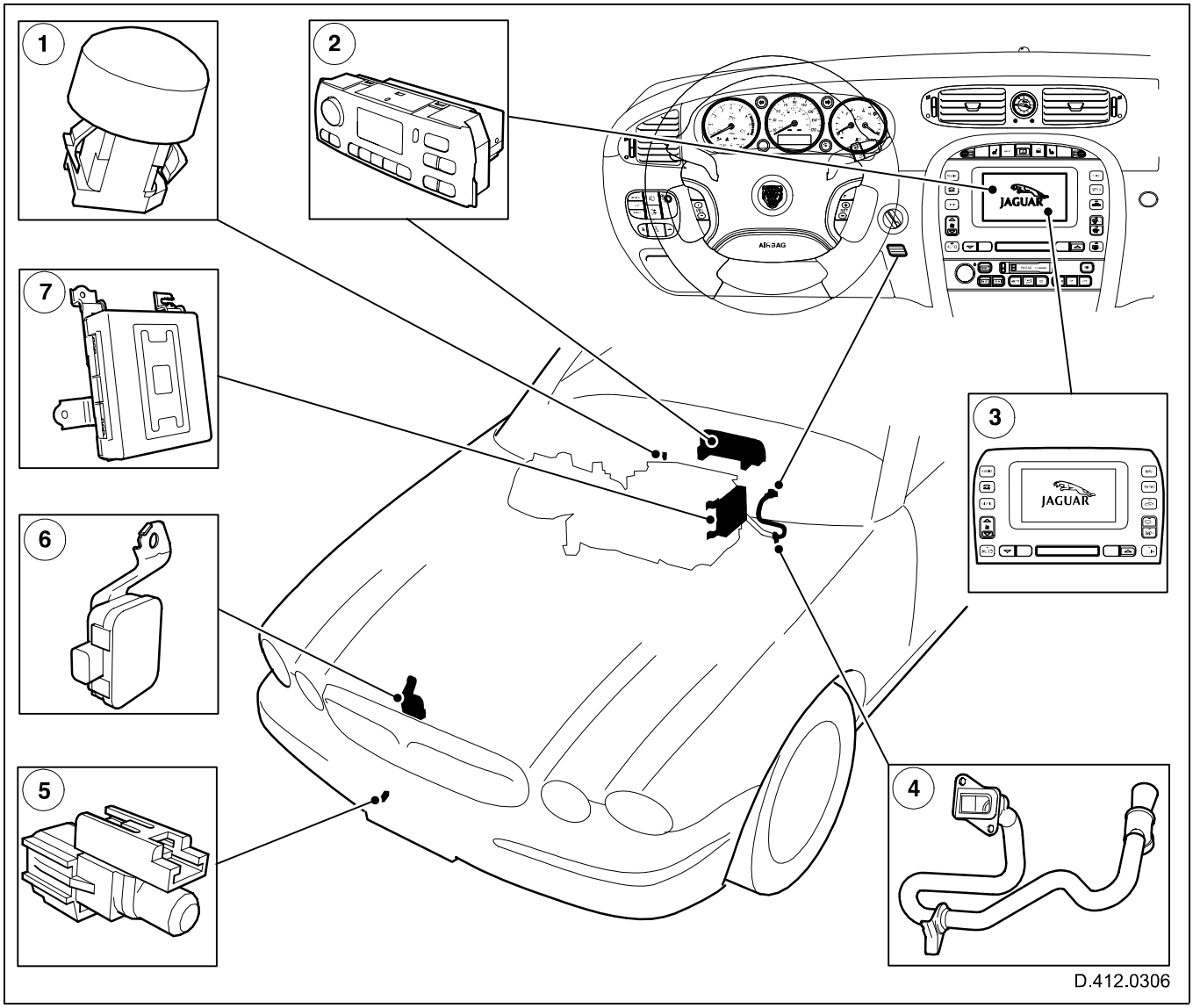


Fig. 83 Automatic climate control components

1. Dual sunload-sensor
2. Control panel with LCD
3. Telematics display module (optional installation)
4. In-vehicle temperature and humidity sensor
5. Ambient air temperature sensor
6. Air quality (smog) sensor
7. Climate control module

Climate Control Module

The climate control module (CCM) is mounted to the driver's side of the climate control assembly; refer to **Fig. 83** and configured to suit either the control panel with LCD or the touch-screen.

Configuration

The module is configured to suit the following options:

- telematics display module or climate control panel with LCD;
- Left-hand drive or right-hand drive;
- Heated front screen or heated wiper park;
- Smog sensor installed or smog sensor not installed;
- 2-zone or 4-zone climate control system.

NOTE: A replacement climate control module must be configured using WDS; refer to **JTIS.**

In response to signals from the in-vehicle temperature sensor, the CCM can drive the air distribution system (when under automatic control) to unique distribution modes in order to reduce the possibility of misting. In addition, the CCM may also increase the auto-blower speed. Manually selected distribution or blower speeds are unaffected.

NOTE: If the CCM detects the risk of misting, signals from the smog sensor are ignored until it is considered acceptable to resume normal operation.

Signal processing and CAN

The climate control module processes electrical input signals from the control panel and the temperature sensors and then provides, where appropriate, output signals to the actuators and display modules. In addition data are sent bidirectionally between the engine control module and the climate control module using the CAN.

Signals provided by the ECM to the CCM include:

- engine speed;
- air conditioning system pressure;
- engine coolant temperature;
- heated screen inhibit;
- air-conditioning compressor inhibit.

Signals provided by the CCM to the ECM include:

- compressor torque;
- heated screen request.

Climate Control Sensors

The climate control module uses feedback from the following sensors before making any necessary adjustments; refer to **New XJ Range Electrical Guide** for detailed connection information:

Evaporator discharge temperature sensor

The evaporator discharge temperature sensor is a thermistor-type device that provides primary feedback to the climate control module. The CCM processes this signal along with others and provides an output to the compressor.

NOTE: The evaporator sensor is integral to the evaporator housing and is therefore not individually serviceable.

Discharge temperature sensors

The discharge temperature sensors are thermistor-type devices, strategically placed to measure the temperature of the face-level air being discharged by the climate control assembly for both driver and front passenger.

NOTE: The sensors are not serviceable.

In-vehicle temperature and humidity sensor

The in-vehicle temperature and humidity sensor comprises two components, a thermistor-type device for measuring in-vehicle temperature and a capacitive device for measuring humidity.

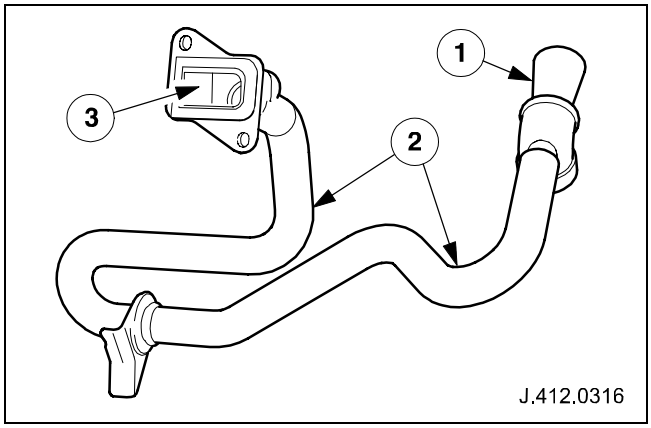


Fig. 84 In-vehicle temperature and humidity sensors

1. Venturi
2. Venturi to sensor hoses
3. Sensor housing

Ambient air temperature sensor

NOTE: The displayed ambient temperature will not change unless the vehicle is travelling faster than 40 km/h (25 mile/h).

The ambient air temperature sensor is a thermistor-type device, located behind the lower front grille.

NOTE: The sensor requires airflow in order to provide effective feedback to the system. The airflow must not be hindered by the addition of accessories.

Dual sunload-sensor

The dual sunload-sensor comprises:

- photo-diodes (that convert light levels to electrical output signals);
- electronic circuits for processing the electrical signals.

NOTE: Obstructing the sunload sensor will significantly affect the behavior of the systems.

Air quality (smog) sensor

The air quality sensor (when installed) is mounted in the engine compartment, in front of the radiator. The sensor detects the presence of petroleum based compounds such as CO and NOx. The levels of CO and NOx, triggers a chemical reaction within the sensor, which generates an electrical output signal proportional to the reaction. The signal is used by the climate control module (CCM) to determine whether the recirculation door should be closed.

The sensitivity of the air quality sensor, for vehicles fitted with the touch-screen (telematics display module) can be set from the 'Options' screen:

- select the 'Climate' hard button;
- select the 'Options' soft button from the climate control screen;
- adjust settings to suit:
  5 - most sensitive.
  3 - regular usage.
  1 - least sensitive.
  0 - sensor inactive.

NOTE: When the sensitivity is set to '0', the recirculation door can still be operated manually and will also be automatically operated when so determined by the CCM.

The sensitivity of the sensor, for vehicles not fitted with the touch-screen can be adjusted from the climate control panel in the following manner:

- Simultaneously pressing 'AUTO' and 'RECIRC' will display a single digit number in the LCD.
- The driver's 'temperature demand' buttons can be used to change the sensitivity level.
- Pressing 'MODE' exits the adjustment mode (exit is automatic after 6 seconds).

NOTE: The smog sensor signal is ignored if:

- **the air conditioning is active and the ambient temperature is 0°C (32°F) or less;**
- **the air conditioning is inactive and the ambient temperature is 5°C (41°F) or less;**
- **the CCM detects conditions which may give rise to interior misting;**
- **latched fresh-air recirculation has been selected.**

Actuators

All actuators are dc motors, mounted to the climate control assembly and controlled by the CCM.

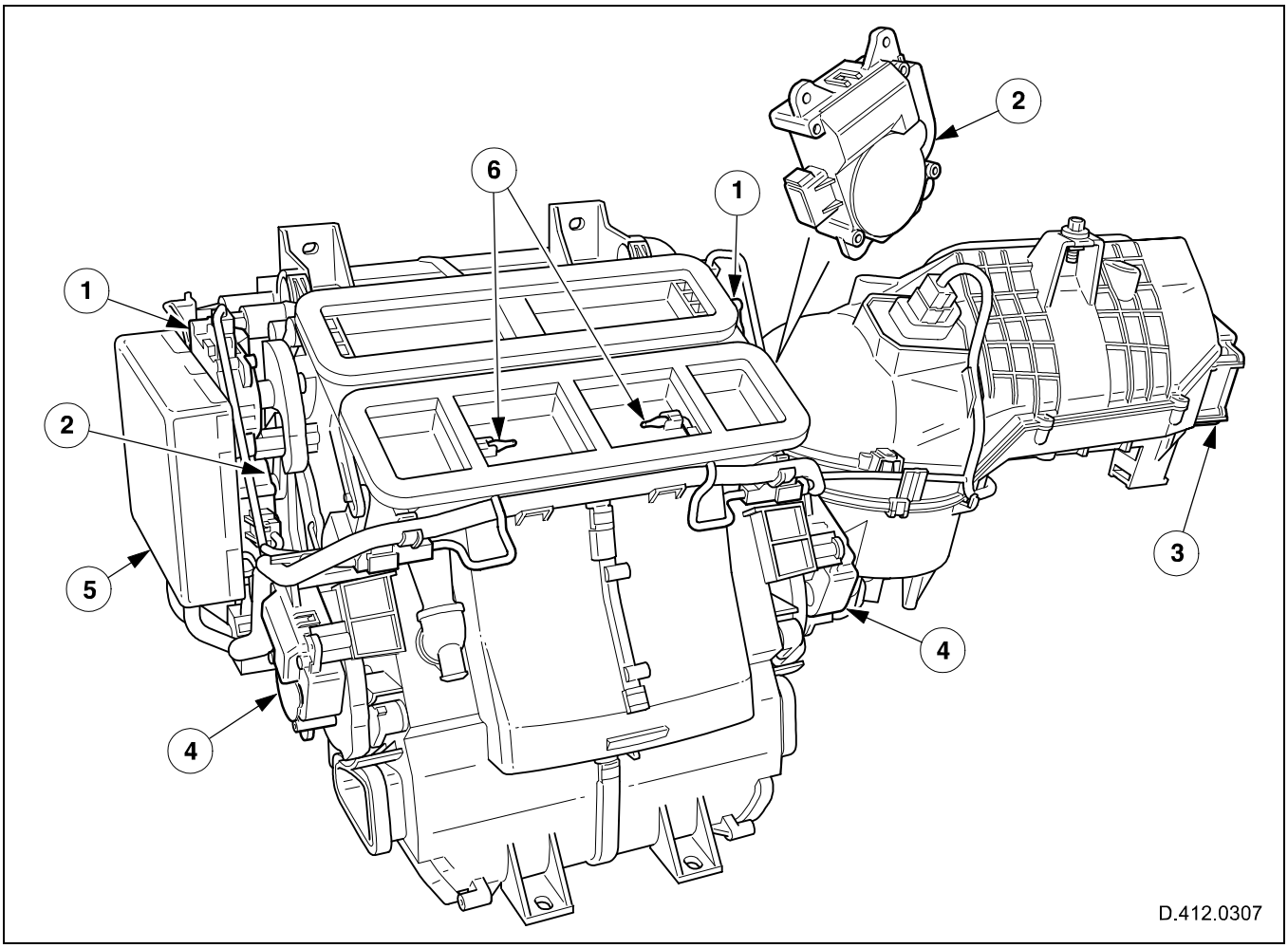


Fig. 85 Control components - climate control assembly

1. Defrost and cool-air bypass door actuator
2. Temperature blend door actuator
3. Recirculation door actuator
4. Floor/face door actuator
5. Climate control module
6. Discharge sensor
7. Evaporator temperature sensor (not illustrated)

Rear Climate Control System

NOTE: Where installed, the rear climate control system (RCCS) will only function when the front climate control system (FCCS) has first been activated. Any deactivation of the FCCS, will automatically deactivate the RCCS. Reactivation of the FCCS will not automatically reactivate the RCCS, manual intervention is required.

Rear Climate Control Panel

The rear climate control panel has its own integrated control module that, where appropriate can be overridden by signals from the main CCM.

Provided the FCCS is already active, the RCCS can be controlled by:

- rear seat passengers using the rear climate control panel (RCCP);
- front seat passengers using the touch-screen (telematics display module).

NOTE: Adjustments using the RCCP are ignored when the telematics display is showing the 4-zone climate control.

Climate control features can be controlled by push buttons and a rotary control. When a function button is pressed, selection is confirmed by a 'beep'. The LCD uses graphic symbols to provide additional confirmation of the system status.

NOTE: The RCCP is not configurable but may be reprogrammed using WDS if necessary; refer to **JTIS**.

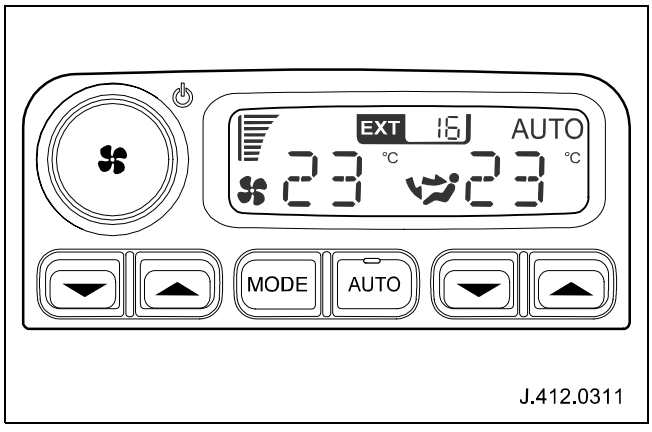


Fig. 86 Rear climate control panel

Operation

Provided the FCCS is already active, the RCCS can be activated using the RCCP by selecting 'AUTO' or depressing the blower knob.

AUTO operation

Selecting 'AUTO' provides full automatic temperature control, including blower speed and air distribution, for both rear positions.

Temperature control

The left and right zone temperatures can be set independently using the red and blue buttons, in the same manner as the front system.

NOTE:

- **HI/LO (maximum/minimum temperatures) cannot be selected from the rear control panel.**
- **Selection of HI/LO using the driver's Tset button, will apply to all four zones and overrides any rear temperature selections.**

MODE button

Pressing the 'MODE' button deselects the 'AUTO' tell-tale LED and allows a choice of manual air distribution. Each press of the 'MODE' button, will cycle through the following air flow options: face level only; face and floor levels; floor only.

Blower speed

Rotating the blower speed knob deselects the 'AUTO' tell-tale LED and allows the blower speed to be changed as confirmed by the bars on the LCD.

NOTE: Selecting the defrost (DEF) option from the front control panel, will limit the rear system blower-speed, but otherwise the rear system will function normally.

Deactivation

Depressing the blower control knob will deactivate the rear system.

Air Distribution

Air distribution to the rear passenger zones is via the registers that are integral to the 4–zone floor console; refer to **Floor Console**.

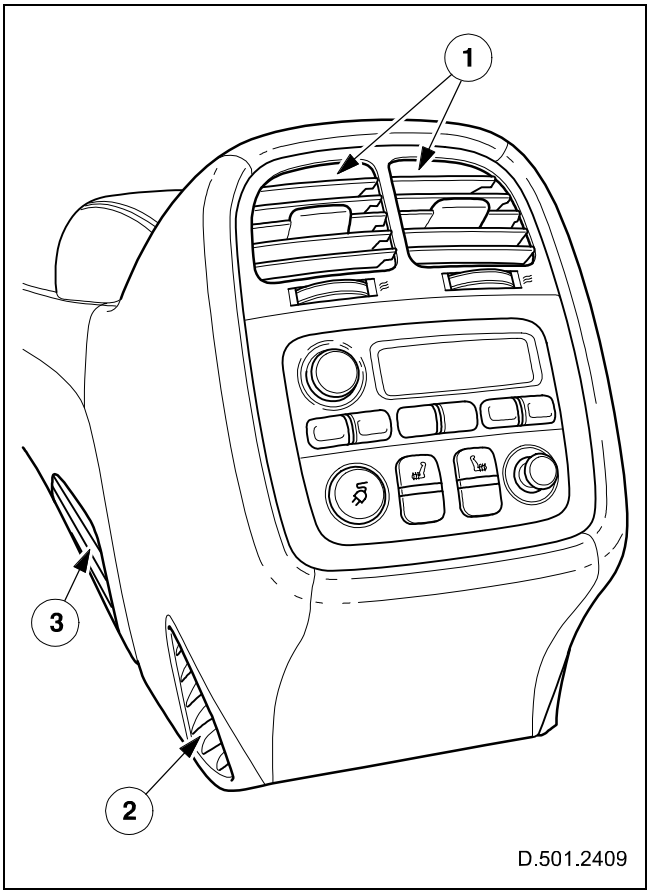


Fig. 87 Rear air distribution

1. Rear face-registers
2. Rear floor-registers
3. Input register

NOTE: The rear face-registers are unique to the 4-zone arrangement.

General

Refer to **New XJ Range Electrical Guide** for detailed connection information and an indication of the flow of electrical data between climate control components.

Diagnostics

The climate control system:

- constantly monitors the status of the system;
- where appropriate, stores a DTC within the climate control module for analysis using WDS.

Air conditioning charge weight

The air conditioning charge weight for 4-zone systems is different to 2-zone systems; refer to the information label located in the engine compartment and to **JTIS**.

Rear Climate Control System Components

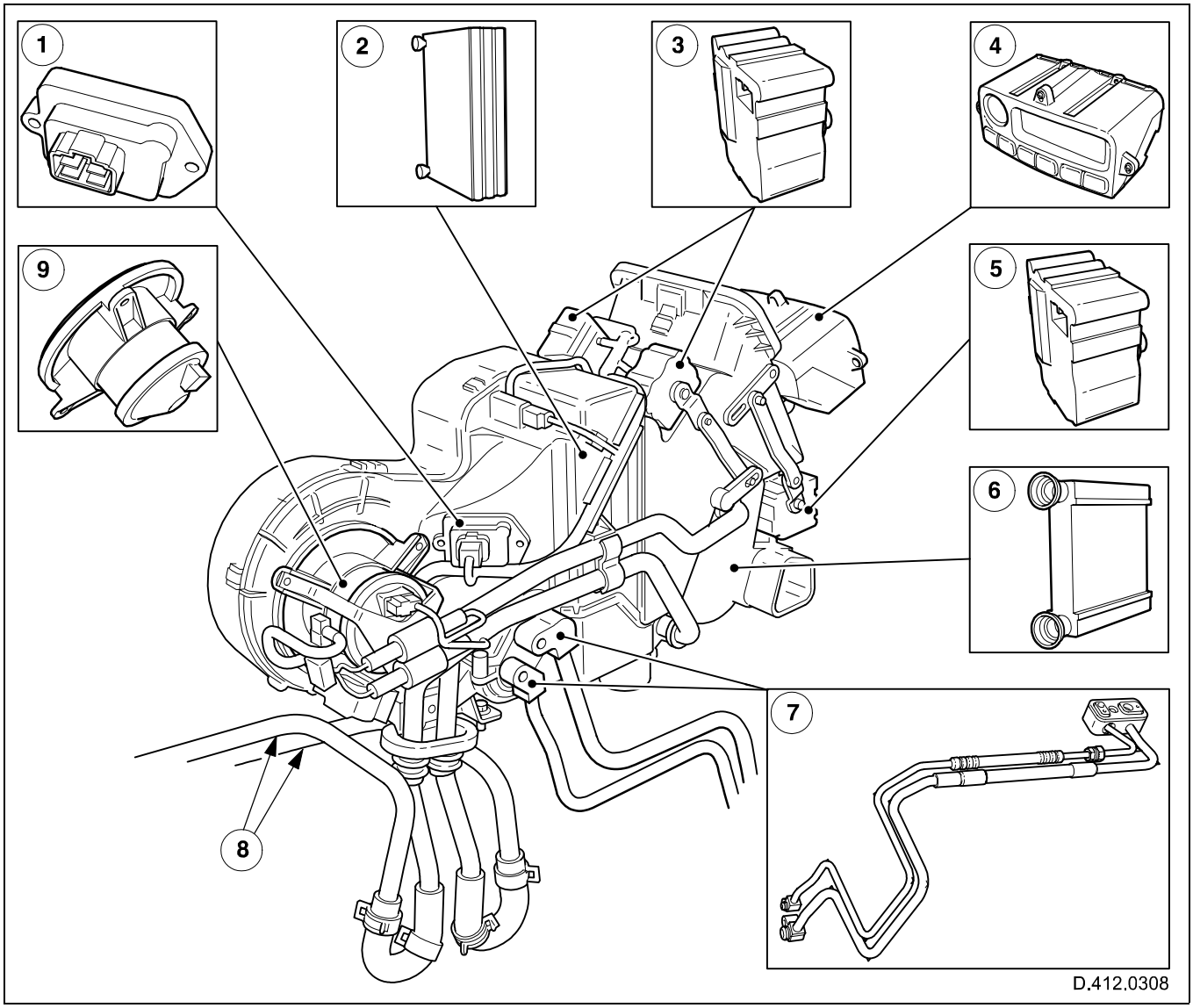


Fig. 88 System components

1. Blower speed module
2. Evaporator core
3. Temperature blend door actuator
4. Climate control panel (includes control module)
5. Floor/face door actuator
6. Heater core
7. Evaporator lines assembly
8. Heater pipes
9. Blower motor
10. Evaporator sensor (not shown)

NOTE: The blower speed module used for the rear climate control assembly is unique and not interchangeable with that installed to the front climate control assembly.

NOTE: Not illustrated, but part of the system and integral to the rear climate control assembly are the thermal expansion valve and magnetic shut-off valve for the refrigerant.

System Interconnections

Fig. 89 shows a typical layout for vehicles fitted with front and rear climate control systems.

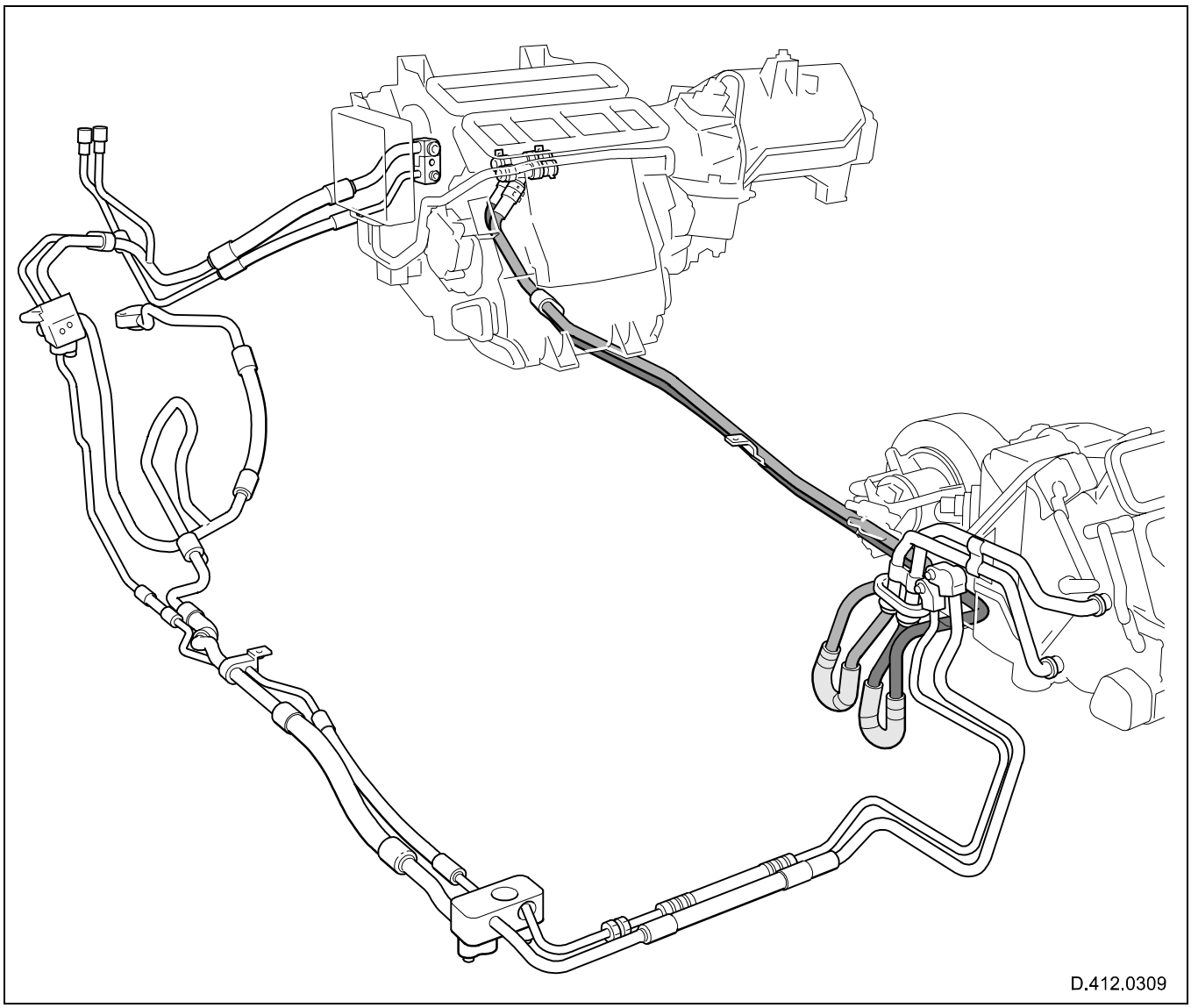


Fig. 89 Rear climate control - typical layout

Refrigerant Flow

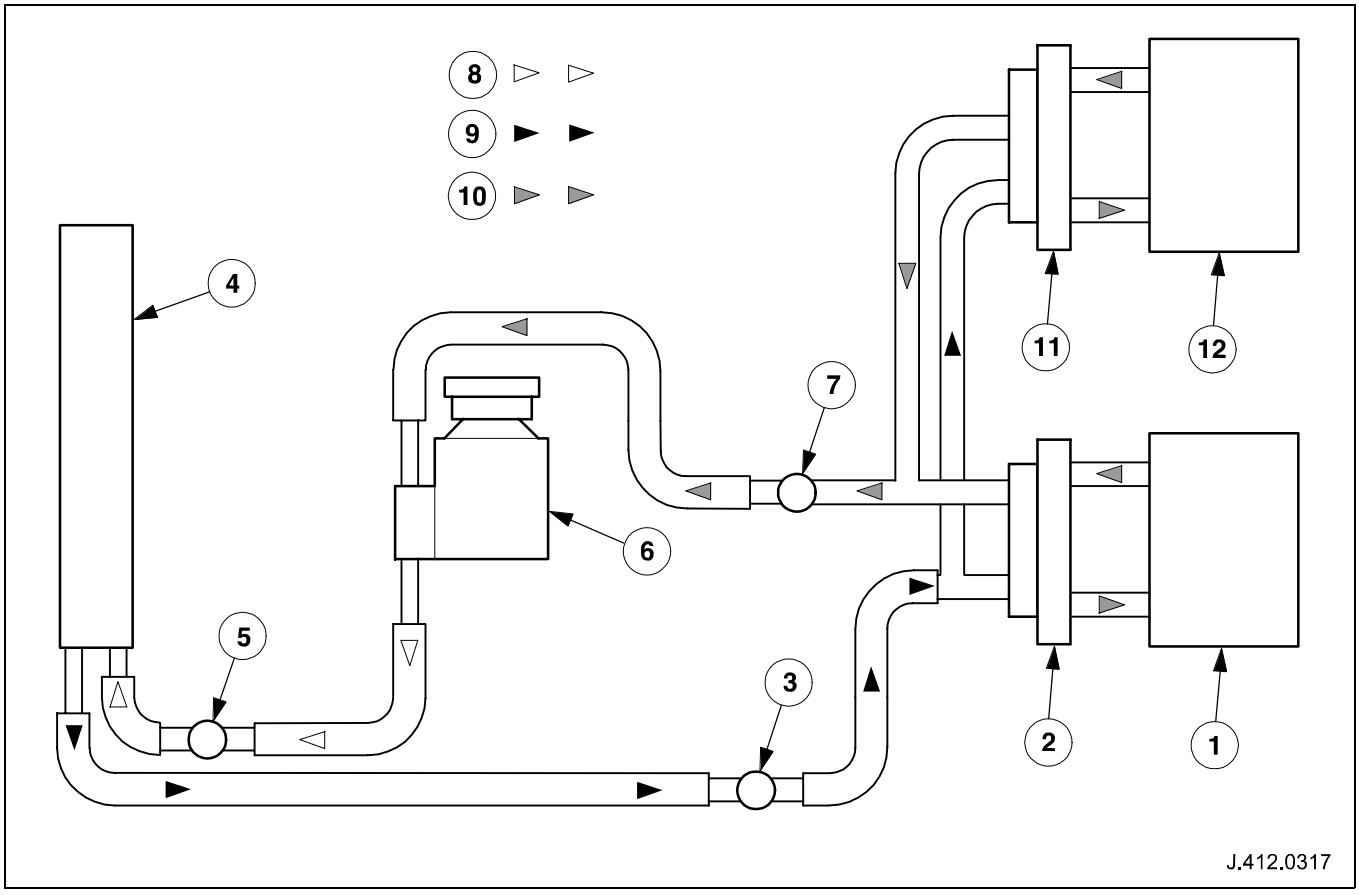


Fig. 90 Air-conditioning refrigerant flow (4–zone)

1. Front evaporator core
2. Front thermostatic expansion valve
3. High-side charge port
4. Condenser/receiver-drier
5. Pressure transducer
6. Compressor
7. Low-side charge port
8. High-pressure refrigerant (gaseous and hot)
9. High-pressure refrigerant (liquid and warm)
10. Low-pressure refrigerant (gaseous/liquid)
11. Rear thermostatic expansion valve
12. Rear evaporator core

NOTE: Not illustrated, but part of the system and integral to the rear climate control assembly is the magnetic shut-off valve for the refrigerant.

Instrumentation and Warning Systems

Instrument Cluster and Panel Illumination

The dimmer control is mounted within the auxiliary lighting switch assembly and is used to adjust the level of backlighting for switches and instruments including:

- Instrument cluster.
- Climate control panel (where applicable).
- Telematics display module (where applicable).
- Audio unit.
- J-gate module (LEDs).
- Auxiliary lighting switch assembly.
- Steering wheel mounted switches.
- Center console switch assembly.
- Fuel filler-flap and trunk lid release switch assembly.
- Overhead console switches and mood lamp.
- Driver door and memory switch assembly.
- Window switches.
- Front and rear ashtray/cigar lighter.
- Front and rear accessory power points.
- Rear climate control panel.
- Climate control registers.
- Rear seat switches.
- Rear seat heater switches.
- Rear grab handle.
- Mood lamp; refer to **Overhead Console**.

NOTE: Pushing and releasing the dimmer control knob releases it from the stowed position for ease of operation.

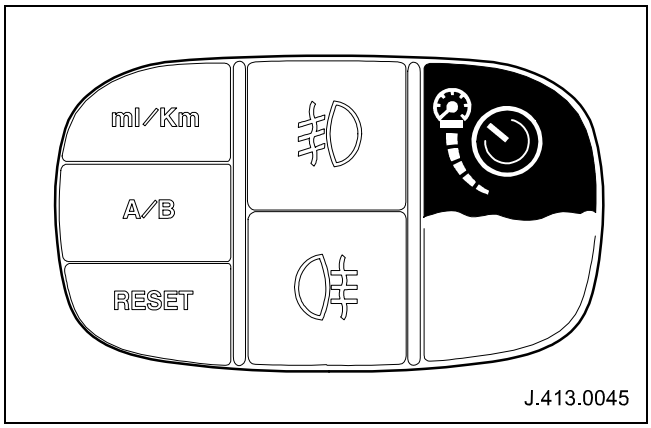


Fig. 91 Dimmer control

The driver-determined level of backlighting is set using the dimmer control, which is directly wired to the instrument cluster. The instrument cluster provides data (via the SCP network) to the front electronic module (FEM), appropriate to the chosen setting. The FEM responds by outputting a pulse-width modulated (PWM) signal to drive the backlighting at the chosen level.

NOTE: The instrument cluster backlighting uses LEDs which are controlled internally - not via the FEM.

Instrument Cluster

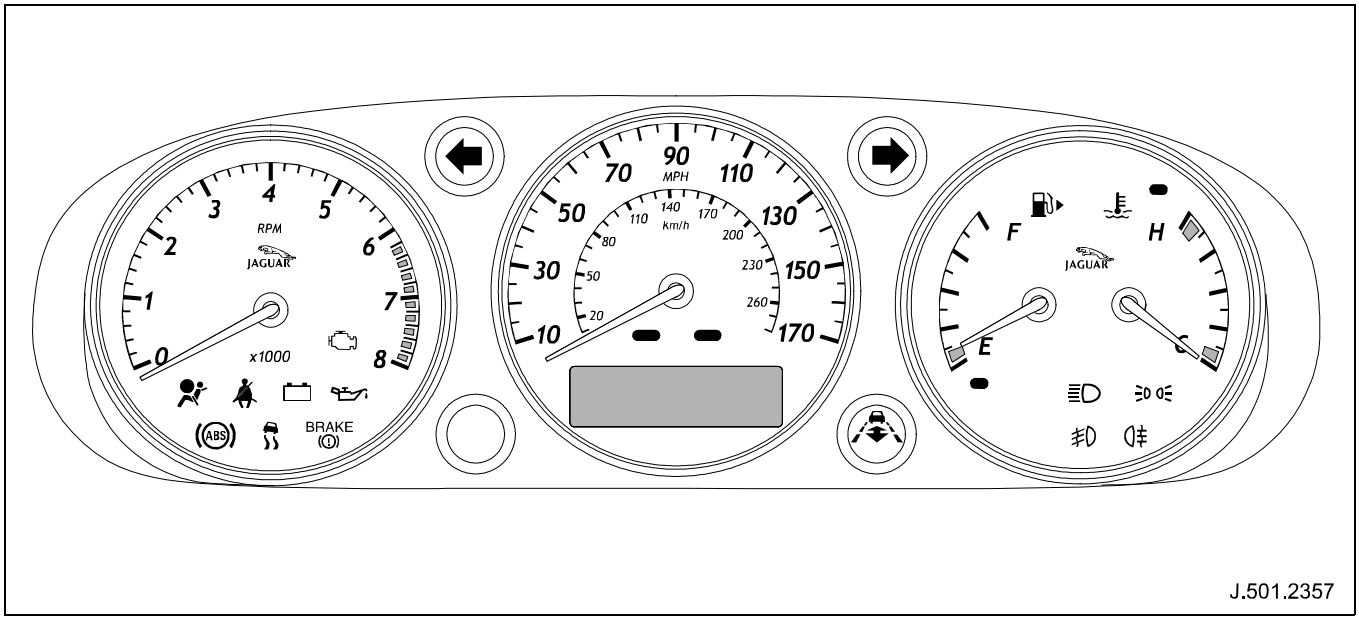


Fig. 92 Instrument cluster

Detailed instrument cluster (IC) features vary depending on market and vehicle specification.

The instrument cluster is a configurable module and:

- provides an interface between the passive anti-theft system (PATS) transceiver, the engine control module (ECM) and the rear electronic module (REM) to enable the immobilization feature; refer to **Anti-Theft**;
- provides a signal to the steering column lock module (SCLM) via the SCP network;
- provides the control for the steering column position (refer to **Steering System**);
- provides multiplex network gateway functionality for CAN and SCP; refer to **Module Communications Network**;
- provides a signal to the VAPS solenoid; refer to **Steering System**.

NOTE: The vehicle speed signal is compared to VAPS curves (stored in the memory of the IC) and an appropriate predetermined signal is output to the VAPS solenoid.

- outputs the warning chimes, except parking aid and adaptive speed control (driver intervene);
- provides decoding for the ignition, courtesy lighting switch and exterior lighting switch.

NOTE: The instrument cluster must be configured to match the ECM and SCLM (refer to **JTIS**).

The cluster comprises four gauges, warning lamps and LCD message center.

Two warning lamps are located above the message center, one red, the other amber. The warning lamps alert the driver to the status of the warning message simultaneously displayed:

- The 'RED' warning lamp indicates a primary warning message that requires immediate investigation by the driver or a Jaguar Dealer.
- The 'AMBER' warning lamp indicates a secondary warning message requiring:
  - appropriate response by the driver;
  - the reporting of any associated malfunction to a Jaguar Dealer at the earliest opportunity.

In addition to the indicators normally found on the instrument cluster such as the malfunction indicator lamp (MIL), there are indicators for:

- Speed control follow-mode active.
- Dynamic stability control/traction control.

Depending on market and vehicle specifications, the following warnings may be displayed via the message:

NOTE: In some instances there is no equivalent visual indicator on the cluster.

- Engine malfunction.
- Door ajar warnings.
- Low washer fluid.
- Dynamic stability control/traction control warning (confirmation of status).
- Speed (cruise) control.

The message center also conveys the following information, when appropriate:

- transmission fault warnings;
- turn signal indicator bulb failure;
- low coolant warning;
- parking brake fault;
- check fuel filler cap;
- DSC on/off/fail;
- autolamp delay setting message;
- pedal (adjustment) inhibit (when speed control is activated);
- column / pedal adjustment status (visual confirmation of selection made using rotary action of the column / pedal adjustment switch);
- ACC (speed control) messages (where applicable).

Odometer, Trip Odometer / Trip Computer

Odometer

The odometer is an integral part of the instrument cluster. The current odometer value is displayed by the message center and is the default display of the trip computer. Odometer values are displayed in miles or kilometers, with suppressed leading zeroes, as six significant figures and no decimal places. The values are stored in non-volatile memory to prevent any loss of data during battery disconnection.

NOTE: The displayed odometer reading will not roll-over when it reaches its maximum value, it will stop.

Trip Computer

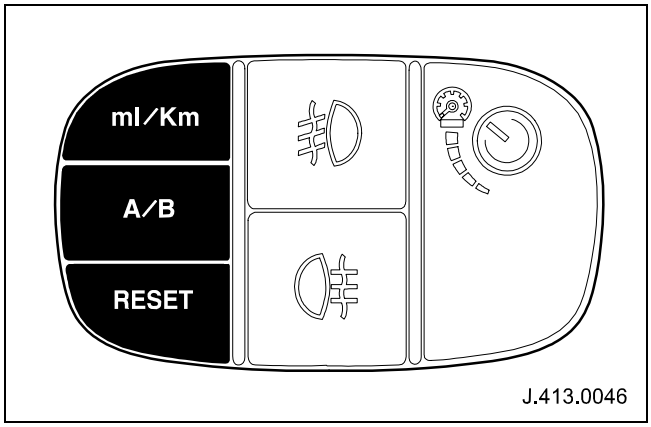


Fig. 93 Trip computer control switches

The trip computer is an integral part of the instrument cluster and is controlled by the three switches located at the outboard side of the auxiliary lighting switch.

- The 'ml/Km' button provides the option to display data in metric or imperial units.
- The 'A/B' button provides the option to track two separate journeys in the trip-computer memory.

- The 'RESET' button is multi-purpose and is used to:
  - cycle between the trip, odometer and message modes;
  - clear (hide) messages (briefly press the button with message-mode selected);
  - reset the selected (A or B) trip-computer memory to zero (hold the button for approximately 3 seconds).

Pressing the 'TRIP' button (located at the end of the left-hand column stalk) will cycle the trip-computer information in the following order:

- odometer;
- trip distance;
- distance-to-empty;
- average fuel consumption;
- instantaneous fuel consumption;
- average speed.

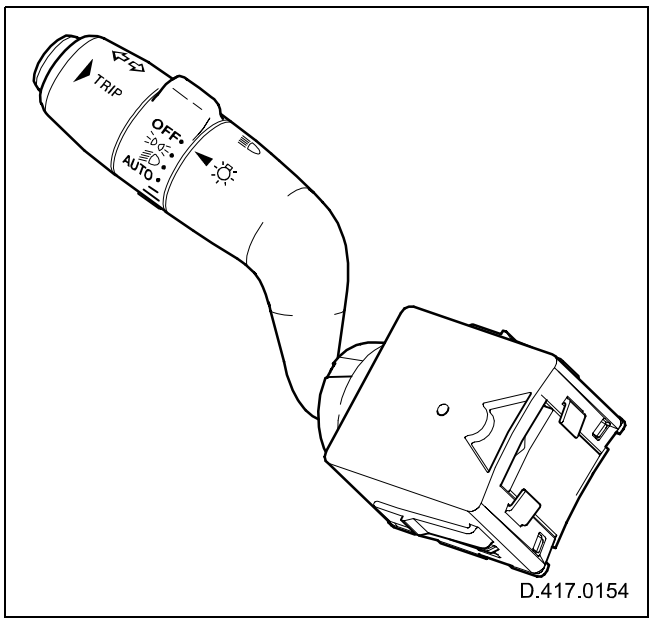


Fig. 94 Trip button

Parking Aid

Reverse Parking Aid

The reverse parking aid system is installed as standard and comprises:

- Parking aid module.
- Audible warning speaker.
- Ultrasonic sensors.

The parking aid module is mounted in the left-hand corner of the luggage compartment near the spare wheel.

NOTE: The module cannot be configured and the system cannot be deactivated manually.

The reverse parking aid system becomes active when the ignition key is turned to position 'II'.

CAUTION: Completing a parking maneuver with the gear shift lever in neutral is not advisable; the sensors are not active and therefore no audible warning will be emitted.

The ultrasonic sensors are designed to detect the presence of obstacles as the vehicle is being parked. Should an object be detected within the sensor range of 1.8m (71 inches) from the rear of the vehicle, the speaker should emit an intermittent audible warning. As the vehicle moves closer to the object, at a distance of 0.3m (12 inches), the intermittent audible warning should change to a continuous audible warning.

NOTE: When driving into a confined space such as a home garage, the outer sensors will detect the side walls and after 3 seconds will disable the audible warning; as movement continues, the inner sensors will eventually detect the rear wall and the audible warning will recommence.

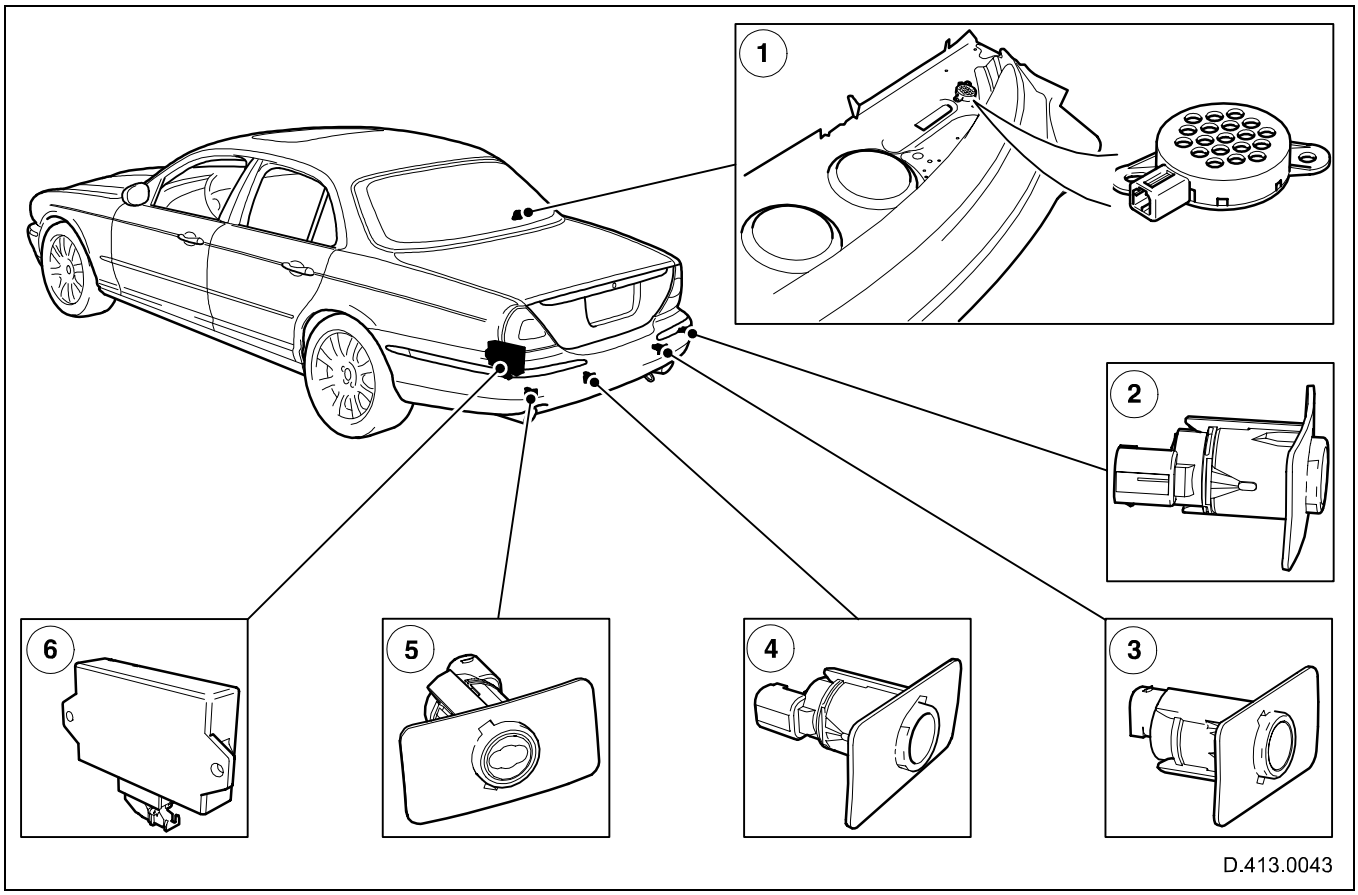


Fig. 95 Reverse parking aid components

1. Speaker
2. Ultrasonic sensor
3. Ultrasonic sensor
4. Ultrasonic sensor
5. Ultrasonic sensor
6. Parking aid module

When trying to establish whether the system is behaving correctly, the following points should be taken into account:

- The range reduces to 0.6m (23.6 inches) at the vehicle corners.
- The vertical range is designed to protect the highest and lowest points at the rear of the vehicle.
- Curbs that are low enough to pass under the vehicle will not be detected.
- Curbs that are higher than 0.18m (7 inches) will be detected.

NOTE: The system is automatically inhibited when the trailer socket is connected.

Front Parking Aid

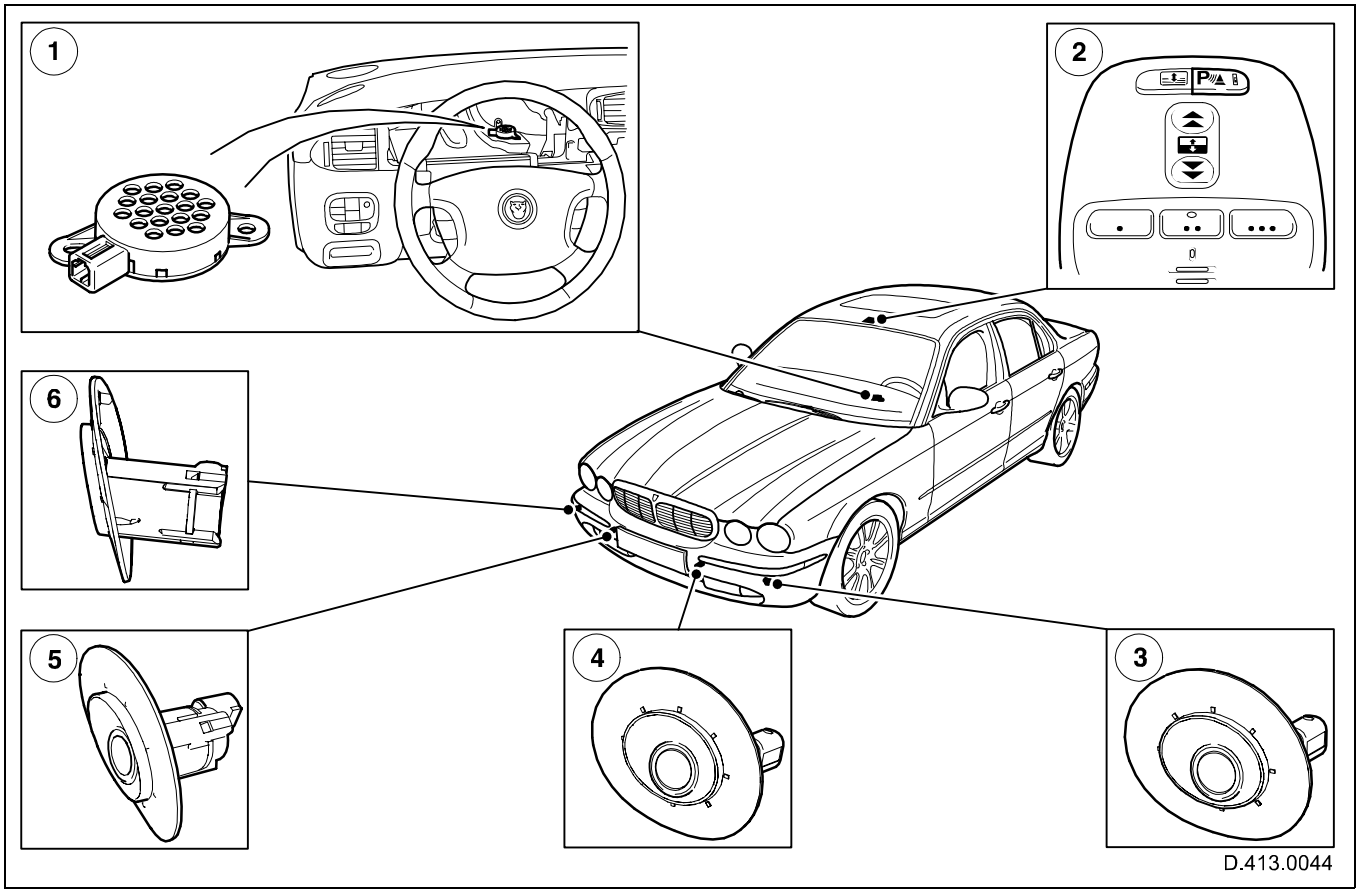


Fig. 96 Parking aid components (front)

1. Speaker
2. Deactivation switch
3. Ultrasonic sensor
4. Ultrasonic sensor
5. Ultrasonic sensor
6. Ultrasonic sensor

The front parking aid system, is installed as an option, requires a different parking aid module to that installed for the reverse parking aid system and comprises:

- Parking aid module.
- Audible warning speaker.
- Ultrasonic sensors.
- Deactivation switch.

The deactivation switch, located in the overhead console, provides the driver with the option to deactivate the system.

CAUTION: Deactivation applies to both the front and reverse parking aid systems.

A warning lamp, integral to the switch, illuminates to confirm the systems have been deactivated.

NOTE: Should a malfunction be detected, the system will be automatically deactivated and the warning lamp illuminated.

The ultrasonic sensors are designed to detect the presence of obstacles as the vehicle is being parked. Should an object be detected within the sensor range of 0.8m (31 ins) from the front of the vehicle, the speaker should emit an intermittent audible warning. As the vehicle moves closer to the object, at a distance of 0.25m (10 inches), the intermittent audible warning should change to a continuous audible warning.

NOTE: The front sensors are not effective at speeds above 15 km/h (9 mile/h) or below 7 km/h (4.5 mile/h).

System Malfunctions

Retrieval of the DTC and subsequent diagnosis of the system should be undertaken using WDS.

NOTE: For reliable operation, all sensors should be kept free from ice and grime. Cleaning the sensors using a high pressure spray should only be undertaken briefly and not from a distance of less than 200 mm (8 inches).

Reverse parking aid only

When reverse gear is engaged, any system malfunction will cause a continuous audible warning to be emitted for 3 seconds (only once per ignition cycle) and a DTC will be stored.

Front and reverse parking aid

When a system malfunction is detected, once per ignition cycle:

- a continuous audible warning will be emitted for 3 seconds;
- the deactivation switch LED will illuminate;
- the system will be deactivated;
- a DTC will be stored.

Battery and Charging Systems

Electrical Load Management System

Load management is not a new concept, but previous forms were restricted to specific modules and worked in isolation from the rest of the electrical system.

A subtle, centralized, electrical monitoring and control strategy has been introduced, designed to accommodate an increase in major electrical features, by limiting the detrimental effect on the battery and ultimately the vehicle.

The electrical load management system (ELMS) does not affect the core functionality of any vehicle system and is transparent to the customer:

- Spare capacity from the generator is utilized to ensure the most efficient operation of components that have particularly demanding power requirements.
- The battery is protected from rapid discharge by the temporary de-selection of features that will only be reinstated when the ELMS permits.

The system constantly compares power consumption against generated power using the vehicle systems listed in **Table 4**.

System	Provides data	Processes data	Performs actions
Engine management	x	x	x
Climate control	x	x	x
Electrical body	x	x	x
Suspension	x		
CAN		x	
SCP		x	
Instrument cluster		x	

Table 4 Contribution of vehicle systems to the ELMS

The ELMS is co-ordinated by the engine control module (ECM), which holds look-up tables (for data comparison purposes) and determines the following operating sequence:

1. Estimate maximum available generator current:
   - uses engine speed, road speed, ECT, IAT, electrical system voltage (at the ECM) and time (since the engine was started).

NOTE: The load management strategy will be inhibited should there be a failure in measurement of any of the above parameters.

2. Calculate the present level of vehicle electrical system loading based on network messages and EMS information:
   - uses CAN and SCP to determine which features are active. Intermittent loads such as seat movements, window lifts and turn signals are not considered.
3. Assess the operational condition of the electrical power supply by continuously monitoring:
   - system voltage at ECM;
   - ambient air temperature.
4. Decide what actions, if any, are required to protect the battery:
   - dependent on the results of the power supply calculations;
   - decides which features to inhibit;
   - determines required idle speed required to support features (subject to limits imposed by the requirements of the powertrain).
5. Perform required actions via CAN or SCP to inhibit or reinstate features.

The ELMS will be inhibited when:

- a CAN system failure is detected;
- the charge warning indicator while the engine is running.

NOTE: When the charge warning indicator is illuminated, the ELMS inhibits the operation of all electrically heated components. This maximizes the period for which the vehicle will remain operational before the battery becomes fully discharged.

Electrical Features

The following features are considered when accessing the level of electrical load:

- Heated front screen.
- Heated rear screen / heated mirrors.
- Heated wiper park.
- Blower motor.
- Side lamps.
- Dipped beam.
- Main beam.
- Front fog lamps.
- Rear fog lamps.
- Windscreen wipers - low speed.
- Windscreen wipers - high speed.
- Heated steering wheel.
- Heated seat (driver).
- Heated seat (passenger).
- Rear heated seat (behind front passenger).
- Rear heated seat (behind driver).
- Air suspension compressor.
- Adaptive damping mode.
- Engine cooling fan.
- Brake lights.

Feature Priority

The operation of the various electrically heated components is continually monitored by the ELMS. The ELMS determines that, in circumstances where the generated electrical power is less than the electrical consumption, selected systems may be inhibited or operated using reduced power for as long as is necessary.

NOTE: Warning LEDs remain illuminated so that any corrective action is not apparent to the driver.

The inhibition of features is examined in the following order:

1. Heated wiper park.
2. Heated rear screen / heated mirrors.
3. Heated front screen.
4. Heated steering wheel.
5. Rear heated seat (behind driver).
6. Rear heated seat (behind front passenger).
7. Heated seat (passenger).
8. Heated seat (driver).

Generator and Regulator

Electrically the generator is similar to previous models except for the voltage regulator functionality.

The engine control module (ECM) can switch the voltage regulator between two voltages to optimize the charging of the battery.

When measured at the generator terminals:

- The low voltage regulator setting is 13.6 volts.
- The high voltage regulator setting is 15.3 volts.

NOTE: The values, which will decrease with a rise in temperature or current flow, are measured with the generator at 25°C (77°F) and charging at a rate of 5 amps.

The ECM:

- Determines the voltage setting of the voltage regulator.
- Always selects the high voltage setting once the vehicle has started.
- Determines the period of time that the high voltage remains selected.

The ECM selects one of three different time periods dependent upon the operating conditions when the vehicle is started:

- The longest time period is selected when both the ECT and the IAT are below 15°C (59°F).
- The intermediate time period is selected when either the ECT or the IAT are above 15°C (59°F) and are also within 10°C (50°F) of each other.
- The shortest time period is the default and is used to provide a short period of boost charge.

NOTE: At the end of these time periods the voltage is always set to the low voltage setting to prevent the battery from being overcharged.

The time periods are variable depending upon the temperature and the battery voltage.

The target voltage of the battery ranges between 14 volts and 14.6 volts (measured at the ECM) depending upon the ambient temperature and the vehicle operating conditions.

NOTE: Once this target voltage has been achieved, providing the vehicle has been operating for at least the shortest time period, the ECM will reduce the voltage regulator to the minimum setting of 13.6 volts.

There are three connections between the ECM and the generator; refer to **New XJ Range Electrical Guide** for details:

1. The voltage regulator request setting from the ECM to the generator.
2. A square signal from the generator to the ECM, which enables the ECM to monitor the generator load on the engine.
3. A charging system indicator signal wire from the generator to the ECM.

If the voltage regulator request line is open circuit or short circuit to battery voltage, the generator will permanently charge at 15.3V. If it is short to ground, it will permanently charge at the lower voltage, 13.6V.

NOTE: A DTC will be generated if a circuit malfunction is detected in any of the three lines connecting the ECM to the generator or if the connector is disconnected. The charging system indicator will also illuminate.

In-vehicle Entertainment Systems

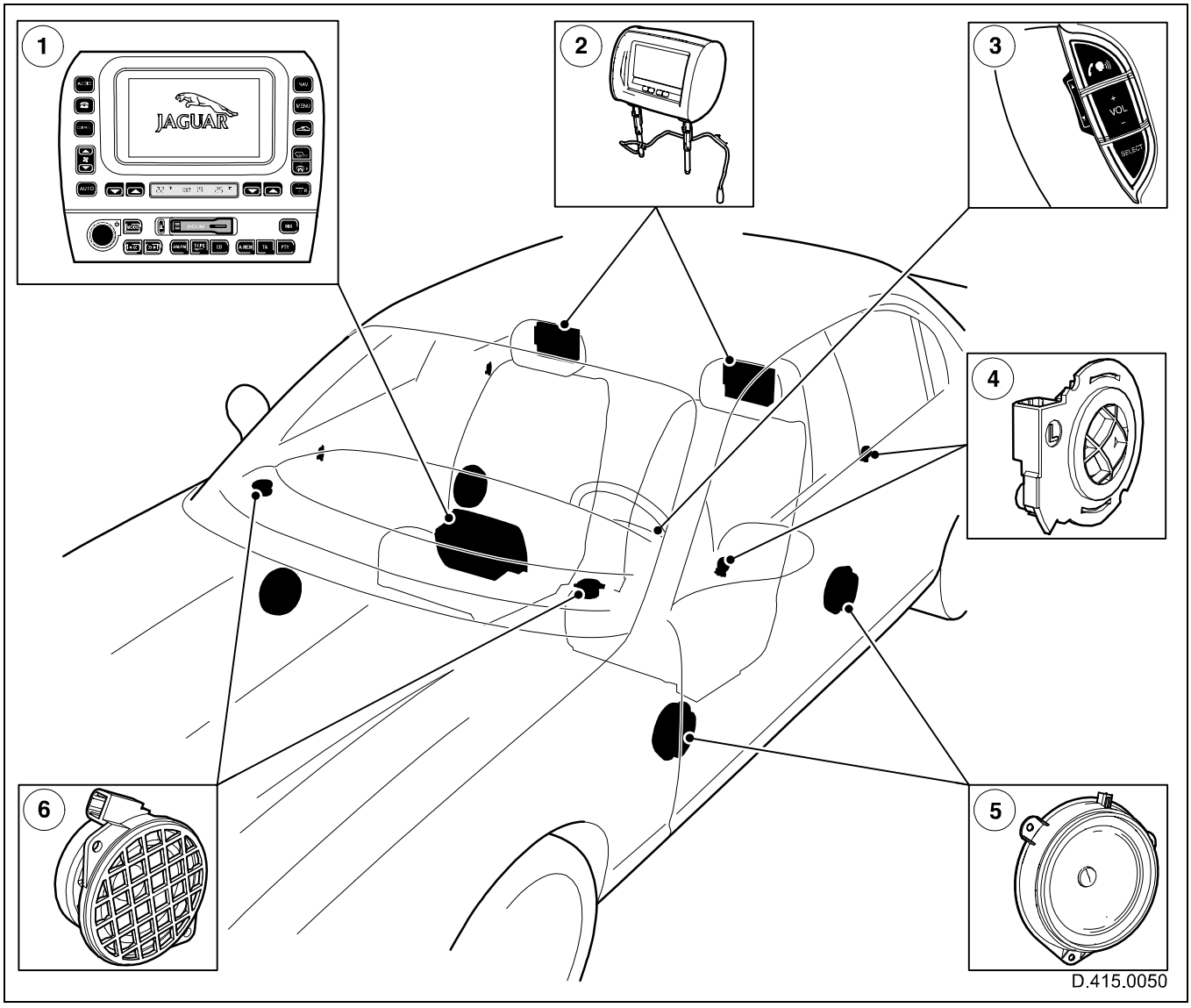


Fig. 97 Entertainment system components - forward locations

1. Audio unit (telematics version)
2. Rear multimedia display (option)
3. Steering wheel telematics controls
4. Tweeter
5. Mid-bass speaker
6. Mid-range speaker

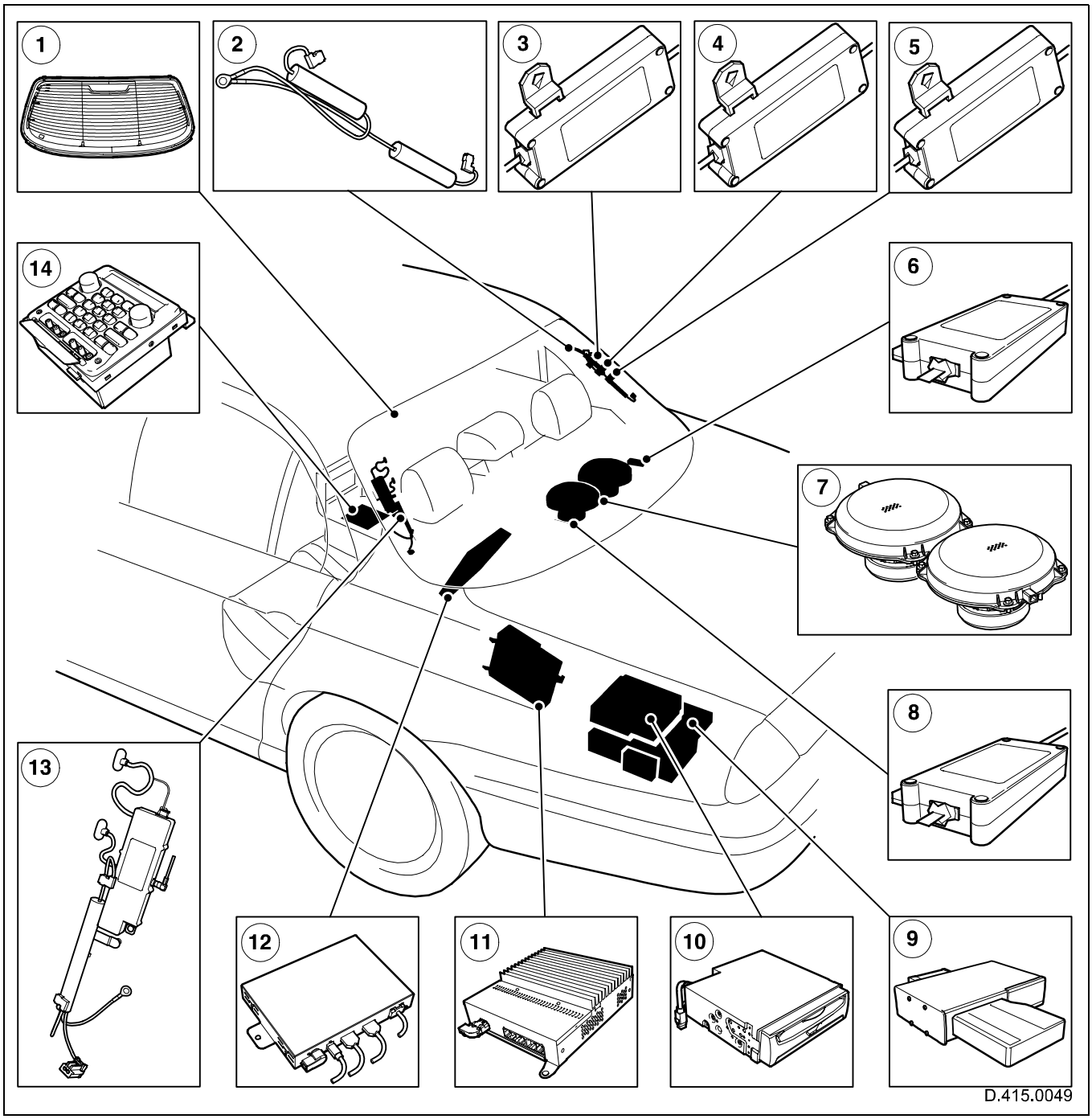


Fig. 98 Entertainment system components - rearward locations

Key to Fig. 98

1. Antennas
2. Double-wavetrap
3. VICS antenna amplifier (Japan only)
4. Television antenna amplifier
5. Television antenna amplifier
6. Television antenna amplifier
7. Sub-woofers (premium system)
8. Television antenna amplifier
9. CD changer (option)
10. DVD player (option)
11. Remote amplifier (premium system)
12. Audio/video switching unit
13. Antenna amplifier and wavetrap
14. Passenger entertainment control panel

NOTE: Specific components will vary according to vehicle and market specifications.

The entertainment systems comprise:

- Audio system.
- Antenna.
- Speakers.
- Video system.
- Rear multimedia system; refer to **Rear Multimedia System**.

NOTE: The entertainment system may also be operated by spoken commands if the optional **Voice Activated Control System** is installed.

Audio System

The audio system comprises:

- Audio unit.
- CD changer (option).
- Steering wheel telematics controls.
- Remote amplifier (option).

Audio Unit

Depending on vehicle specification, the audio unit is combined with the telematics display module (telematics version, **Fig. 99**) or integrated with the phone keypad and small LCD (non-telematics version, **Fig. 100**).

The audio unit:

- Manages the D2B network and provides the gateway to the SCP network; refer to **D2B network**.
- Stores diagnostic trouble codes for itself and the CD changer (where installed).

NOTE: The installation of new components within the audio system will necessitate the reconfiguration of the system using WDS.

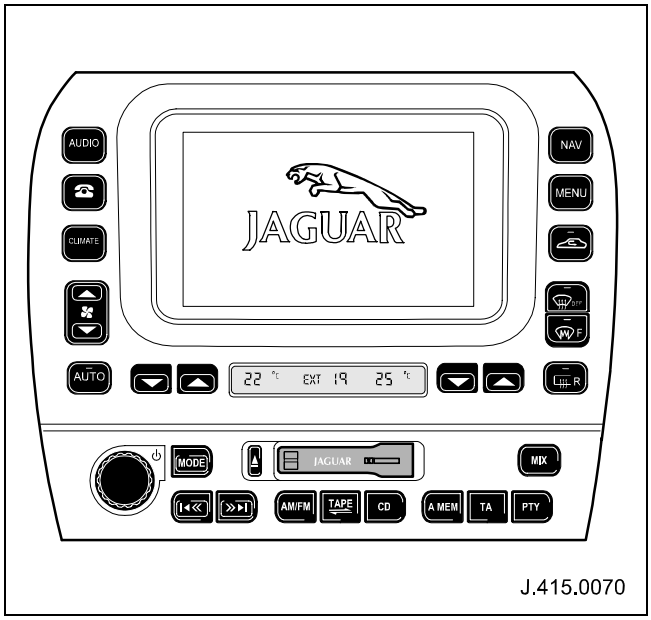


Fig. 99 Audio unit - telematics version

Telematics version

NOTE: The telematics display module also provides the ability for the user to control such features as climate control; refer to **Telematics Display Module**.

The telematics version of the audio unit is integrated with the telematics display module and comprises:

- radio cassette or single-slot CD or single-slot MD
- integral amplifier (4 x 35W output) or remote amplifier (8 x 40W output).

When the rear multimedia option is installed, a 'pop-up window' will appear when certain functions from the rear multimedia system are selected; the window is for information only and will disappear after a few seconds.

Non-telematics version

The non-telematics audio unit comprises:

- radio cassette or single-slot CD or single-slot MD
- liquid crystal display (LCD) including clock;
- integrated phone keypad;
- integral amplifier (4 x 35W output) or remote amplifier (8 x 40W output).

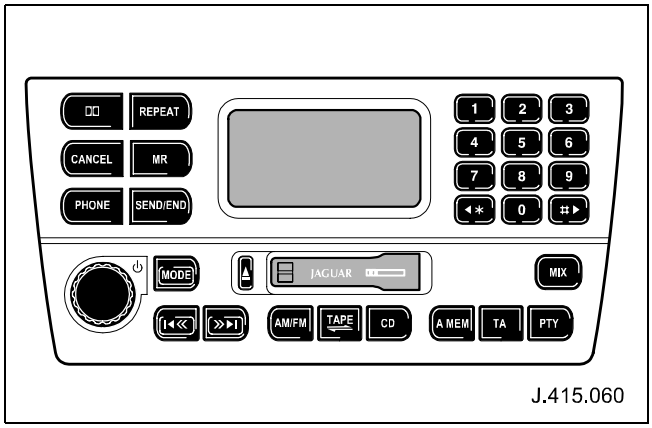


Fig. 100 Audio unit - non-telematics version

NOTE: The non-telematics version of the audio unit is complemented by the climate control panel/module; refer to **Climate Control System**.

Remote Amplifier

The remote amplifier (where installed) is:

- located in the luggage compartment to the left-hand side;
- mounted to the rear-stack bracket;
- capable of delivering 8 x 40W output;
- part of the **D2B network**.

CD Changer

The CD changer (where installed) is:

- located in the luggage compartment to the left-hand side;
- mounted to the rear-stack bracket;
- operated from either version of the audio unit; refer to **Audio Unit**;
- part of the **D2B network**.

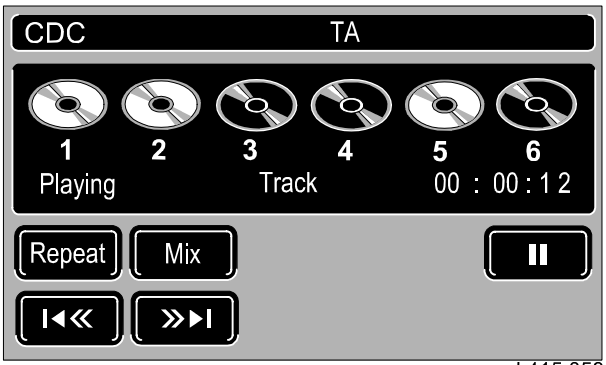


Fig. 101 CD changer - telematics display screen

Steering Wheel Telematics Controls

To ensure minimum disruption to concentration when driving, limited control of audio, telephone and voice activation systems is possible using the steering wheel telematics controls.

The controls provide the following functionality:

- Answer phone call, mute, or select voice activation.
- Increase or decrease volume.
- Selection of radio FM, AM, tape cassette, CDs, and phone ready mode.
- Cycle through preset radio stations, the next CD track or tape AMS (automatic music search).

Antenna

The following antennas (where applicable) are integrated into the rear window glass:

- FM element (incorporated into the demist pattern).
- AM element (separate element at the top left side of the glass).
- The FM/AM antenna amplifier is located at the left-hand C-post and is connected to the screen by press studs.

NOTE: The power connection to the demist screen includes an in-line filter known as a positive wavetrap.

Diversity antenna

Depending on vehicle and market specification the demist screen can be configured as a 3-part diversity antenna to provide improved FM reception in multipath areas. Three antennas are derived from the demist pattern to provide three FM inputs. The amplifier switches between each of the three FM inputs and sends the strongest to the radio.

Diversity antenna for TV and VICS

The television receiver uses '4-part antenna diversity' to obtain the optimum signal from four television antenna patterns. There are four television antenna amplifiers to suit, two are located on the package tray and two at the right-hand C-post.

Japan only

An additional antenna amplifier is installed for the vehicle information communications system (VICS); refer to **Fig. 98**.

Speakers

The premium audio sound system comprises:

- Four lightweight mid-bass door speakers;
- Four door-mounted tweeters;
- Two mid-range speakers (instrument panel mounted);
- Two sub-woofers.

The standard audio sound system comprises:

- Four lightweight mid-bass door speakers;
- Four door-mounted tweeters.

Video System

The video system is optional and dependent on market and vehicle specification, it comprises:

- Telematics display module; refer to **Telematics Display Module**.
- Television antennas and amplifiers; refer to **Antenna**.

The television receiver is integrated into the telematics display module (where applicable) and teletext is available in appropriate markets.

NOTE: The video system may have been extended to accommodate rear seat passengers; refer to **Rear Multimedia System**.

Rear Multimedia System

The rear multimedia system, which is an optional installation, depending on market and vehicle specifications, comprises:

- Passenger entertainment control panel;
- Rear multimedia displays;
- DVD player;
- Audio/video switching unit.

The rear multimedia system provides rear seat passengers with the opportunity to select from a choice of different entertainment sources, independent of each other and to that selected by the front passenger. The system is flexible enough to allow for example, the front passenger to watch a television broadcast, one rear passenger to watch a DVD and the other to use a games console.

NOTE: Rear seat passengers can also control the main entertainment system components: audio unit (tape cassette/mini-disc/tuner) and CD changer.

In addition, when combined with the multi-zone voice option, the system allows rear seat passengers to participate in hands-free conference calls (provided the cellular phone system is installed) or to voice-control audio and climate control functions.

Passenger Entertainment Control Panel

Depending on market and vehicle specifications, the panel is located in the rear armrest or the rear floor console. The panel is part of the D2B network; refer to **D2B network** and interfaces with the audio/video switching unit to facilitate user control of any installed multimedia options; refer to **Fig. 105**.

The panel has two input sockets to allow individual connection of audio headsets and two sets of auxiliary inputs to allow connection of external audio/video sources such as a games console, a camcorder or an MP3 player.

NOTE: The passenger entertainment control panel can be inhibited by front seat passengers.

To inhibit the passenger entertainment control panel:

- non-telematics version - select and hold the 'MODE' button on the audio unit until 'TRAFFIC' is displayed. Repeatedly press the 'MODE' button until 'RMS' mode is displayed (this immediately follows the RMS rear speaker mode setting). Use the 'TRACK UP'/'TRACK DOWN' keys to make the desired selection.
- telematics version - select 'MENU' from the telematics screen, followed by 'REAR MULTIMEDIA', then select from one of the three options: Unlock, Headphone Only, Lock.

NOTE: Cellular phone and voice capabilities will also be inhibited.

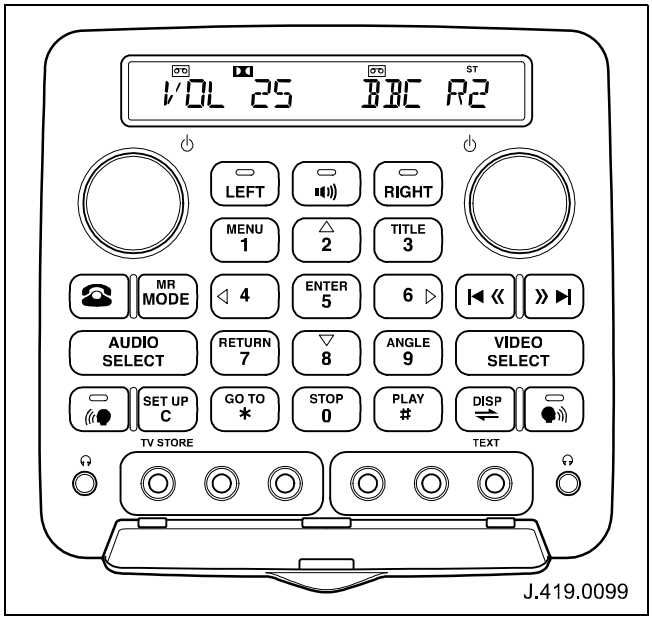


Fig. 102 Passenger entertainment control panel

Depending on the options installed, the control panel can be used to select and control the following: single CD, mini-disc, tape cassette and tuner, DVD, TV (including teletext, where available) and cellular phone dialing.

NOTE: The panel, provided the multi-zone voice option is installed, allows rear seat passengers to participate in hands-free conference calls (provided the cellular phone system is installed) or to voice-control audio and climate control functions; refer to **Voice Activated Control System**.

Audio can be directed to one of three output sources by selecting the appropriate mode:

- LEFT headset
- CABIN speakers
- RIGHT headset

NOTE: Selection of the mode is confirmed by the illumination of the tell-tale LED on the corresponding button.

Momentarily pressing the 'AUDIO SELECT' button on the passenger entertainment control panel displays the current signal source. A different source can be selected by each subsequent press of the button until the desired choice is displayed. Available options (subject to that particular option being installed) include: FM, AM (MW, LW), TAPE (or MD, CD), TV, DVD, AUX1, AUX2.

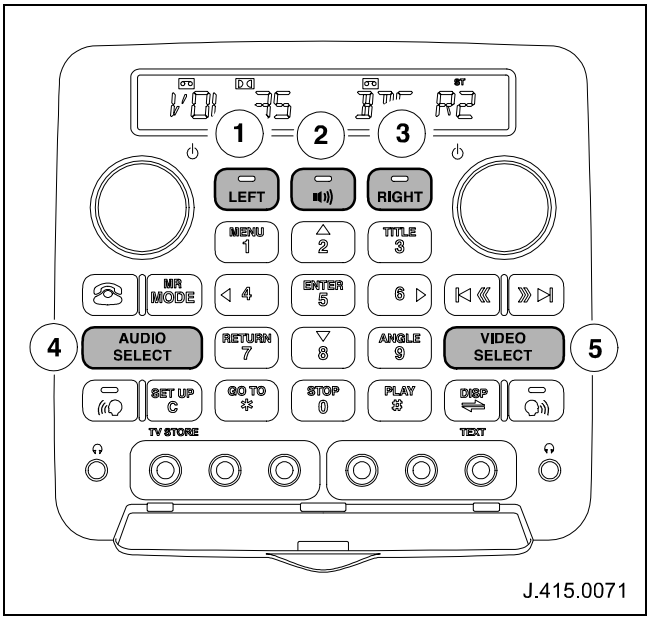


Fig. 103 Selection control buttons

1. LEFT headset select
2. CABIN speakers select
3. RIGHT headset select
4. AUDIO SELECT
5. VIDEO SELECT

Rear Multimedia Display

The rear multimedia displays are 6.5in color liquid crystal displays, mounted within the head restraints of the front seats.

Each display has the following user controls:

- 'ON/OFF' button.
- 'MENU' button.
- Two buttons: '-' and '+'for navigating the 'on-screen' options.

Momentarily pressing the 'VIDEO SELECT' button on the passenger entertainment control panel displays the current signal source. A different source can be selected by each subsequent press of the button until the desired choice is displayed. Available options (subject to that particular option being installed) include: TV, DVD, AUX1, AUX2.

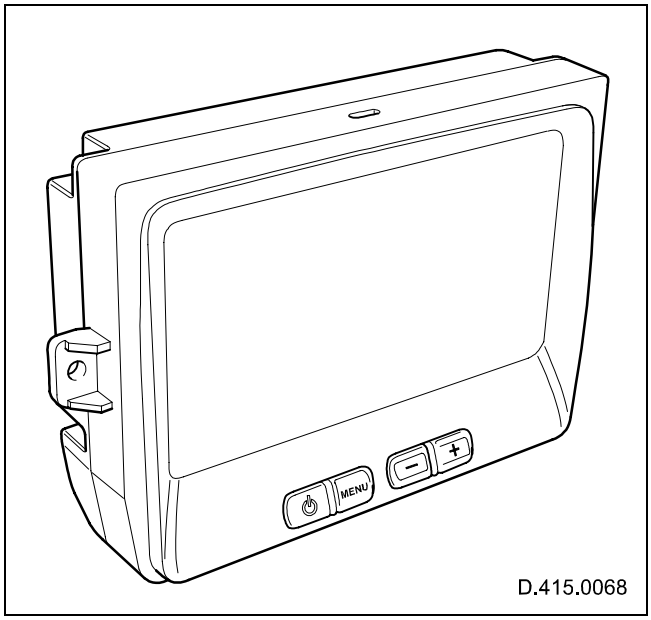


Fig. 104 Rear multimedia display

DVD Player

The optional DVD player is mounted to the left-hand side of the luggage compartment as part of the multimedia stack.

NOTE: The DVD player is region-specific and therefore will only read compatible DVDs.

Audio/video Switching Unit

The audio/video switching unit interfaces with any installed multimedia equipment and the passenger entertainment control panel to allow rear seat passengers to select a particular signal source, which typically includes:

- Television (via the telematics display module).
- Main audio (CD, mini-disc, tuner).
- DVD player.

The diagram, **Fig. 105** provides an indication of how the unit interfaces the multimedia components; refer to **New XJ Range Electrical Guide** for detailed connection information.

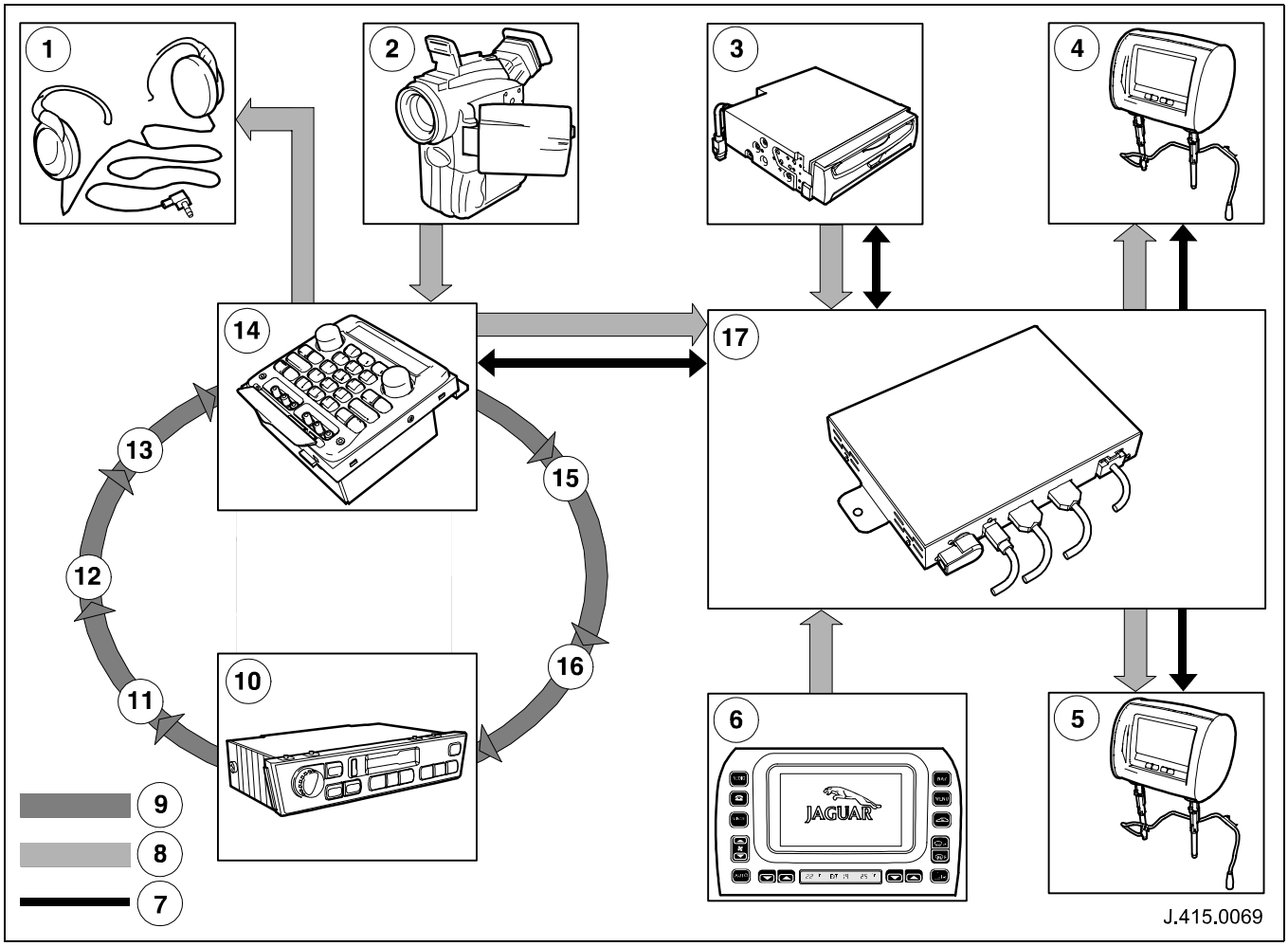


Fig. 105 Audio/video switching interface diagram

1. Personal headset
2. Camcorder (or other compatible device)
3. DVD player
4. Rear multimedia display
5. Rear multimedia display
6. TV receiver (integral to telematics module)
7. Control signals
8. Audio/video signals
9. D2B network
10. Audio unit
11. CD changer
12. Cellular phone control module
13. Voice activation module
14. Passenger entertainment control panel
15. Navigation control module
16. Power amplifier
17. Audio/video switching unit

Lighting

Exterior Lighting

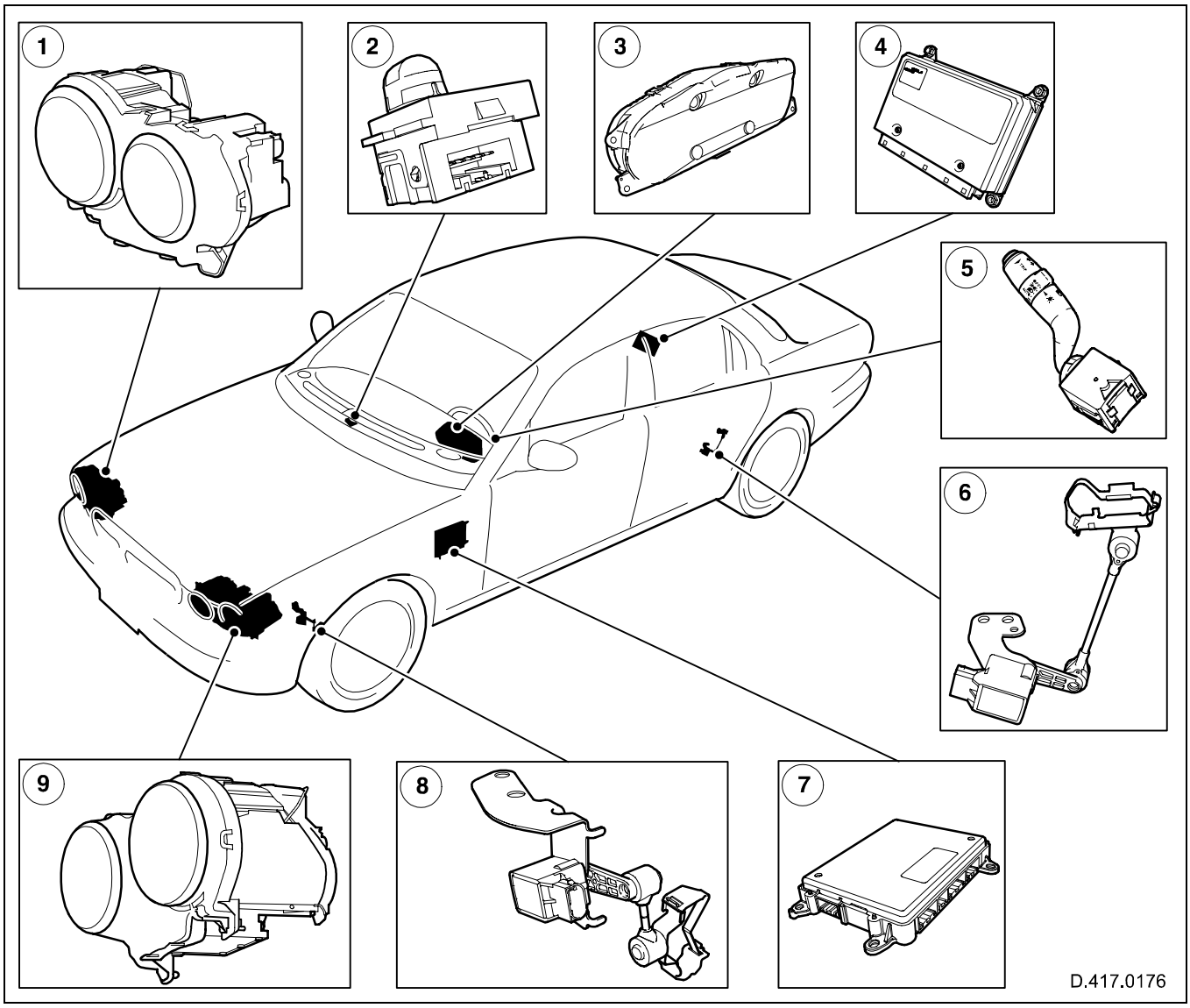


Fig. 106 Headlamp features

1. Right-hand headlamp assembly
2. Autolamp sensor
3. Instrument cluster
4. Air suspension module
5. Main lighting switch
6. Left-hand rear-axle level sensor assembly
7. Front electronic module
8. Left-hand front-axle level sensor assembly
9. Left-hand headlamp assembly

The exterior lighting is activated by choosing the appropriate option on the main lighting switch assembly (the left-hand column stalk).

Depending on market and vehicle specification the headlamp assembly will comprise one of three options:

- Conventional halogen lighting.
- Xenon, high intensity discharge lighting (low beam functionality only).

NOTE: A conventional halogen bulb is used for the high beam and 'flash-to-pass' feature.

- Bi-xenon, high intensity discharge lighting (high and low beam functionality).

NOTE: A conventional halogen bulb is used for the 'flash-to-pass' feature only. The xenon lamp is not suitable for operating in this manner, doing so will cause premature failure of the lamp and/or the control module.

All lighting input signals are decoded by the instrument cluster and an appropriate signal sent via the SCP network to the front electronic module (FEM) and rear electronic module (REM). Providing other conditions are correct, the FEM and REM will output a ground signal to the appropriate lamps or relays; refer to **New XJ Range Electrical Guide** for detailed information.

Main Lighting Switch

The left-hand stalk is a multi-function switch assembly used to activate the following as appropriate:

- Side lamps;
- Low-beam headlamp;
- High-beam headlamp;
- Autolamp;
- Turn signal indicator lamps;
- Exit delay;
- Trip cycle; refer to **Odometer, Trip Odometer / Trip Computer**.

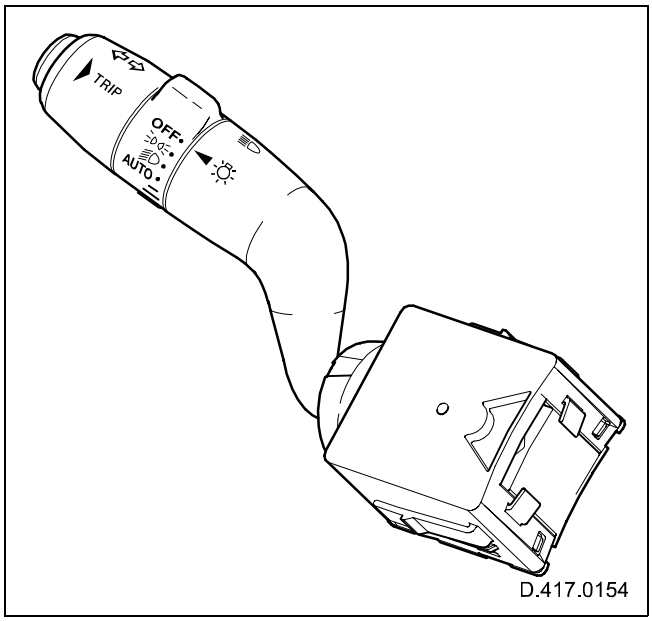


Fig. 107 Main lighting switch

Exit delay

The exit-delay feature is controlled by the front electronic module (FEM) and is activated when one of the exit-delay positions is selected using the rotary collar on the main lighting switch. Depending on the position selected, the main beam will illuminate for 10s, 30s or 2m.

NOTE: The feature does not function when the rotary collar is set to 'AUTO'.

Halogen Headlamps

NOTE: Approximately 5 minutes after activating the headlamps, a noticeable fall in light output may be observed. The effect is due to a voltage boost feature that has been introduced; refer to **Generator and Regulator**.

Bi-xenon and Xenon High-Intensity Discharge Headlamps

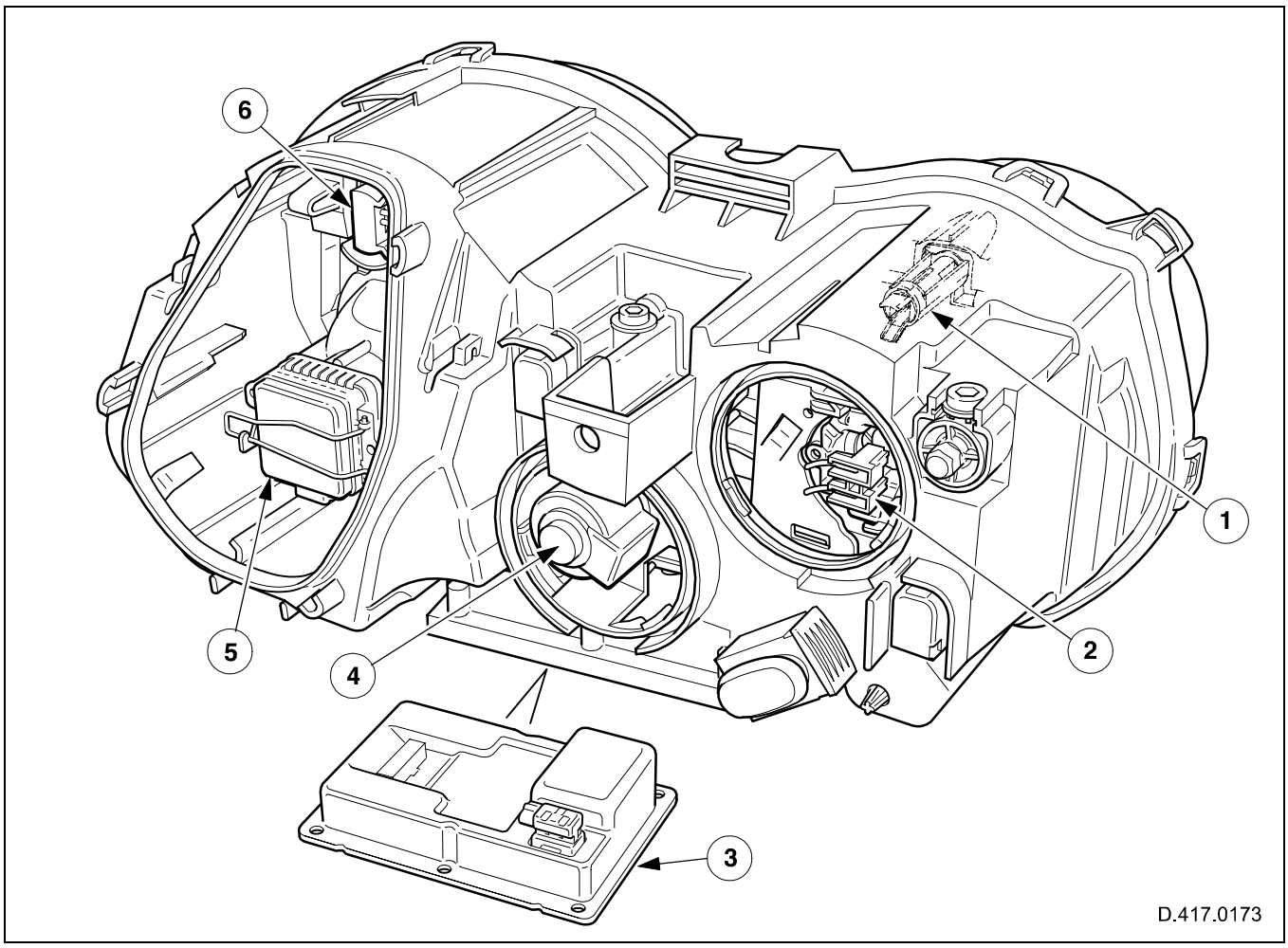


Fig. 108 High-intensity discharge lamp assembly

1. Pilot lamp
2. High beam (flash-to-pass) lamp
3. Xenon lamp control module
4. Motor (automatic headlamp leveling)
5. Xenon lamp assembly
6. Turn signal lamp

NOTE: Due to national legislation, vehicles equipped with high-intensity discharge headlamps require the installation of **Automatic Headlamp Leveling** and a **Headlamp Cleaning System**.

The high-intensity discharge headlamp assembly (where applicable) comprises:

- Xenon lamp;
- Halogen lamp;
- Pilot lamp;
- Turn signal lamp;
- Xenon lamp control module;
- Ignitor;
- Headlamp leveling motor.

Vehicles fitted with the high-intensity discharge lighting system use xenon lamps for the low beam instead of standard halogen lamps.

NOTE: In some markets, vehicles are fitted with a bi-xenon lamp assembly that can also provide a high beam output; refer to **Xenon Lamp Assembly**

- The turn signal and pilot lamps are conventional lamps.

Xenon Lamp Assembly

The bi-xenon lamp uses a solenoid-operated flap to switch between low and high-beam operation. During low-beam operation the flap prevents light from entering the bottom of the diverging lens. When high-beam is required, operation of the high-beam switch, energizes the solenoid, which moves the flap away from the xenon lamp, allowing light to enter the bottom of the diverging lens to produce the high-beam pattern.

NOTE: A conventional halogen bulb is used for the 'flash-to-pass' feature only; the xenon lamp is not operated. Igniting and extinguishing the xenon lamp several times during a small period of time, will cause premature failure of the lamp and/or the control module.

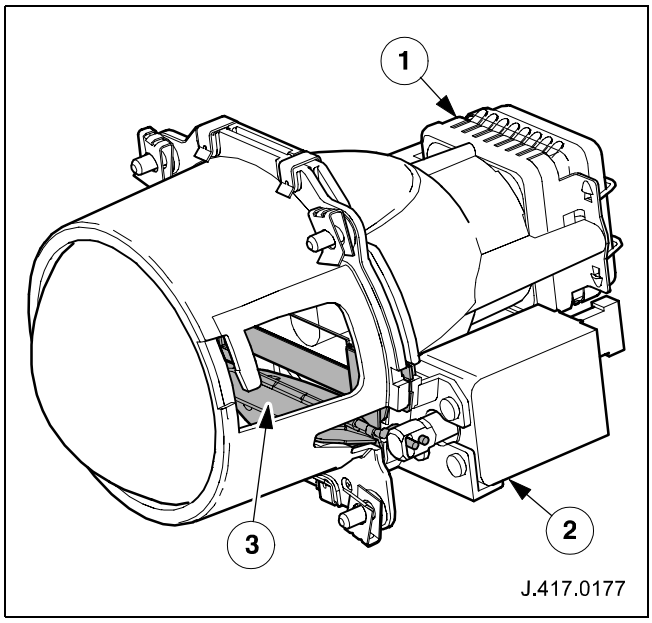


Fig. 109 Bi-xenon lamp assembly

1. Igniter
2. Solenoid
3. Flap

The 35 watt xenon lamp produces a beam with an intensity that is approximately three times that produced by a conventional lamp of the same wattage.

The chamber, item 1 (**Fig. 110**) contains xenon gas and a mixture of metal halide salts.

High voltage (typically 20kV) ignition is provided by the xenon lamp control module and an arc forms in the chamber as the gap between the two electrodes is bridged. After ignition there is a warm-up period of approximately three seconds, during which the metal-halide salts evaporate. This brief excess-current phase is followed by stabilization of the arc and the regulation of the lamp output at 35W by the control module.

NOTE: Unlike conventional lamps, xenon lamps do not deteriorate and so should last the lifetime of the vehicle.

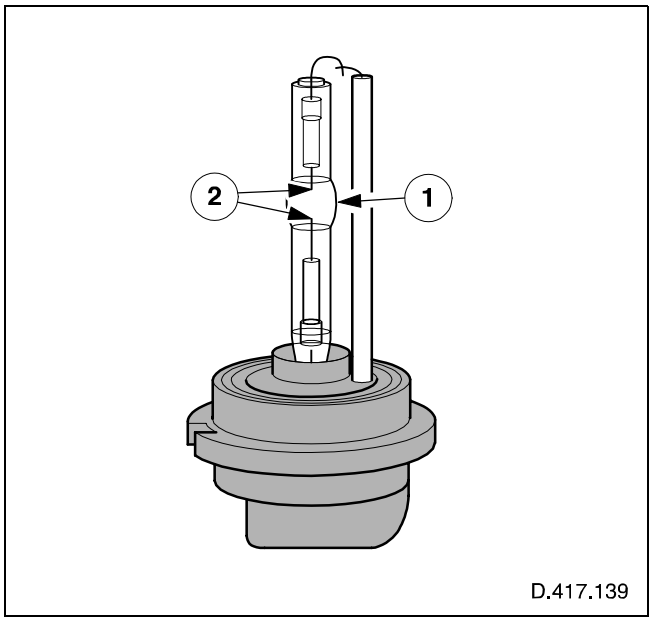


Fig. 110 Xenon lamp

1. Gas-filled chamber
2. Electrodes

Xenon Lamp Control Module

Each high-intensity discharge (HID) lamp assembly has a separate control module, which in addition to regulating start-up and stabilizing output, provides circuit protection by recognizing malfunction conditions such as power supply deviations and short circuits.

NOTE: The high-voltage stage will be deactivated unless all system components are functional and correctly connected.

In addition, a headlamp leveling drive circuit is integral to the xenon lamp control module. The drive circuit monitors input signals received from the air suspension module and outputs a drive signal to the headlamp leveling motor that will correct the position of the lamps.

Automatic Headlamp Leveling

NOTE: After disconnecting any element of the automatic headlamp leveling system, recalibration will be necessary using WDS.

The system comprises:

- Left-hand front, height sensor assembly;
- Left-hand rear, height sensor assembly;
- Air suspension module;
- Left-hand, headlamp leveling motor;
- Left-hand, xenon lamp control module;
- Right-hand headlamp leveling motor;
- Right-hand xenon lamp control module.

Automatic headlamp leveling is operational when the ignition key is at position 'II'.

NOTE: Each time that the ignition key is turned to position 'II', the headlamp levelling motors are recalibrated to ensure that the headlamps are set at the correct height in relation to vehicle attitude.

The headlamp leveling drive circuit is integral to the xenon lamp control module. The left-hand height-sensors (part of the air suspension system) are inductive devices that respond to the vertical position of the vehicle and supply feedback signals to the air suspension module (ASM). The ASM processes the data and supplies a pulse-width modulated (PWM) signal to each xenon lamp control module. The signal is monitored every 10ms, should it deviate from the last stored values, the module will cause the headlamp leveling motors to drive the headlamps to a new, calculated position. A schematic representation of the component interconnections is shown in **Fig. 111**; refer to **New XJ Range Electrical Guide** for detailed connection information.

NOTE: Due to data processing time, there is a delay of approximately 80ms between changes in suspension height and any headlamp adjustments that may be required.

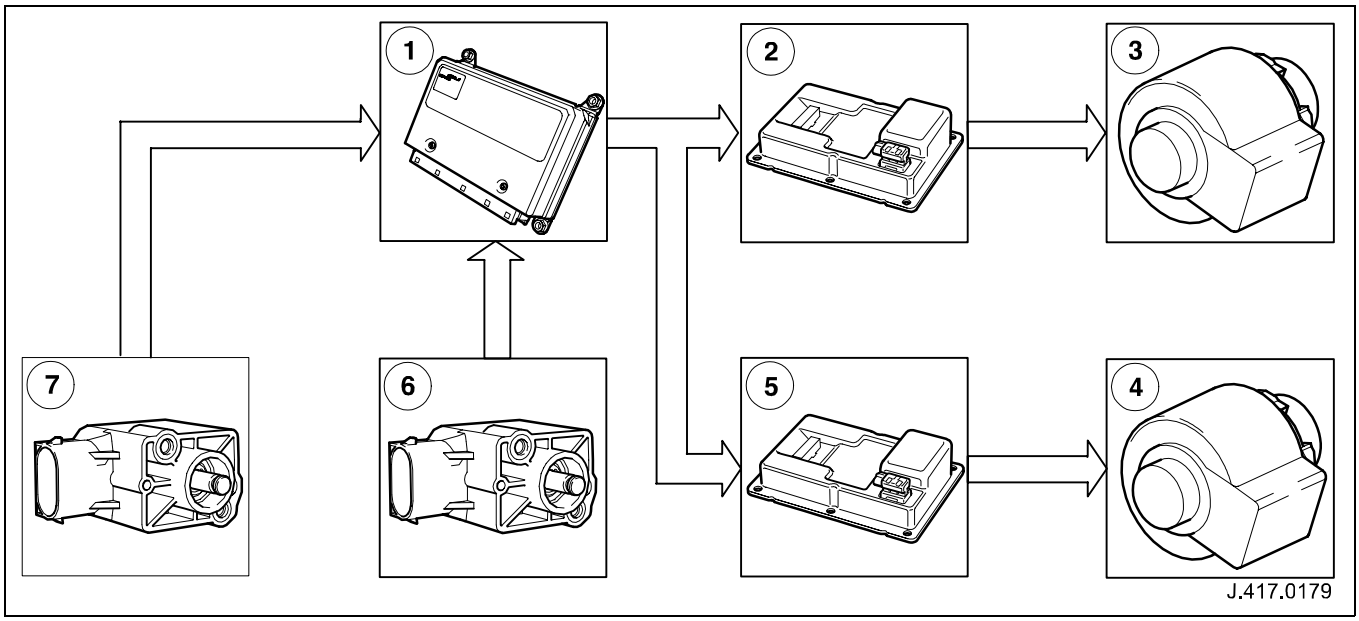


Fig. 111 Automatic headlamp leveling system

1. Air suspension module
2. Left-hand xenon lamp control module
3. Left-hand headlamp leveling motor
4. Right-hand headlamp leveling motor
5. Right-hand xenon lamp control module
6. Left-hand front height sensor
7. Left-hand rear height sensor

Diagnostics

System malfunctions will cause a DTC to be stored in the xenon lamp control module. Retrieval of the DTC and subsequent diagnosis of the system should be undertaken using WDS.

Auxiliary Lighting Switch

The auxiliary lighting switch assembly comprises:

- Dimmer control; refer to **Instrument Cluster and Panel Illumination**.
- Trip computer switches; refer to **Odometer, Trip Odometer / Trip Computer**.
- Front and rear fog switches; refer to **Front and Rear Fog Lamp Switches**.

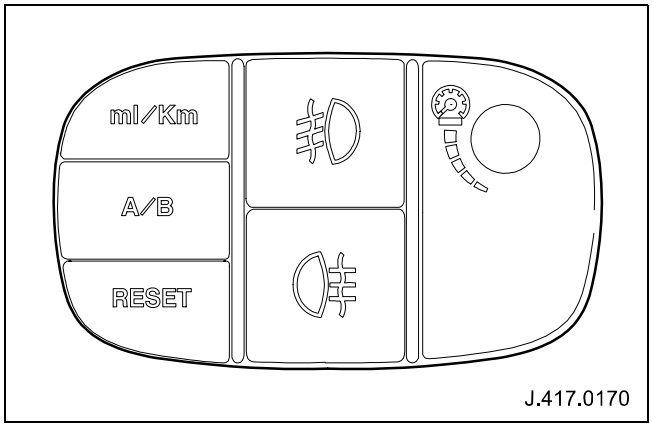


Fig. 112 Auxiliary lighting switch

Autolamp

The operation of the autolamp feature (where applicable) is dependent on ambient light levels, monitored by photo-diodes integrated into the autolamp sensor. The sensor provides feedback to the instrument cluster, which responds by supplying control signals on the SCP network to the front electronic module (FEM) and rear electronic module (REM). Where appropriate, the side lamps and low-beam headlamps will operate automatically providing:

- The ignition key is at position 'II' or 'III'.
- The AUTO option on the main lighting switch is selected.

NOTE: Since the operation of the lamps depends on the sensor, which is located behind the demist grille of the instrument panel, it is important that the windshield be kept clean and that the sensor is not covered.

The sensor is calibrated to monitor ambient light levels as follows:

- Detection of darkness for 3 seconds continuously, will cause the low beam and side lamps to be activated.
- Detection of daylight for 15 seconds continuously, will cause the exterior lighting to be extinguished.
- Detection of semi-darkness for 15 seconds continuously, will cause the low beam and side lamps to be activated.

NOTE: Japanese specification autolamp responds to darkness after 1.5 seconds and daylight after 4 seconds.

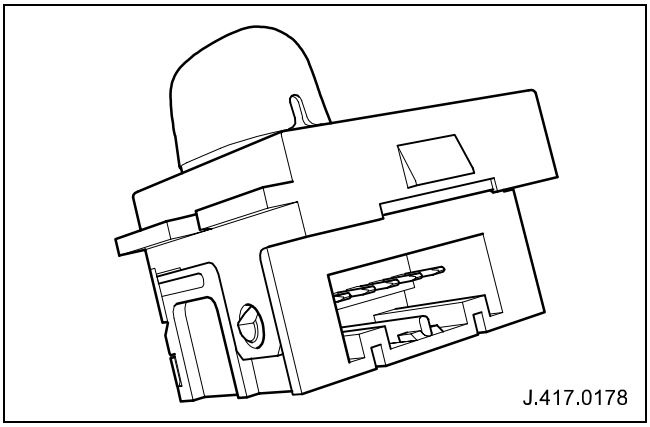


Fig. 113 Autolamp sensor

Rear Lamp Assembly

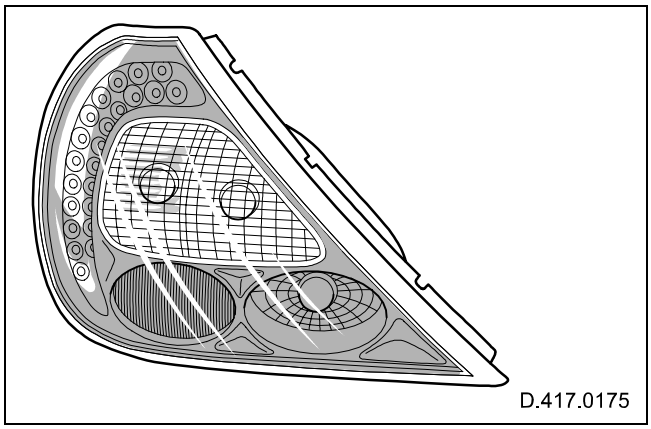


Fig. 114 Lens - rear lamp assembly

The rear lamp assembly uses conventional tungsten bulbs for the turn signal, fog guard and reversing lights.

The tail and stop lights share twenty-four, pcb-mounted LEDs.

Using LEDs instead of conventional tungsten filament bulbs provides the following advantages:

- Lower energy consumption.
- Reduction in heat generated (allowing the distance between the lens and the light source to be reduced).
- Increased reliability and longer service life.
- Constant light intensity over the life of the LEDs.
- A faster operational response time of approximately 130ms for the LEDs compared with 210ms for a conventional bulb.

NOTE: The LEDs can be replaced only as a complete PCB assembly.

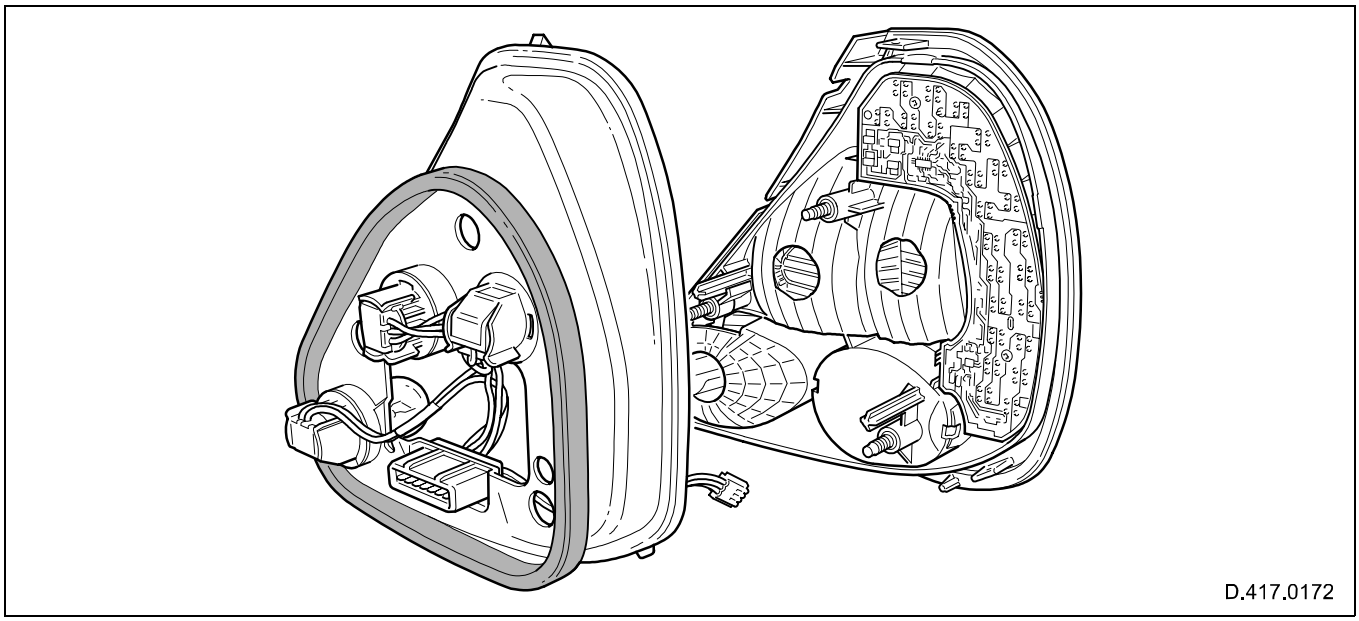


Fig. 115 Rear lamp assembly

When the lighting switch is operated to activate the main vehicle lighting, all LEDs are illuminated at a constant intensity level to provide the tail lights. Subsequent operation of the footbrake pedal will cause all LEDs to illuminate at a higher intensity to provide the stop lights.

NOTE: The high-mounted stop light operates in synchronization with the stop lights.

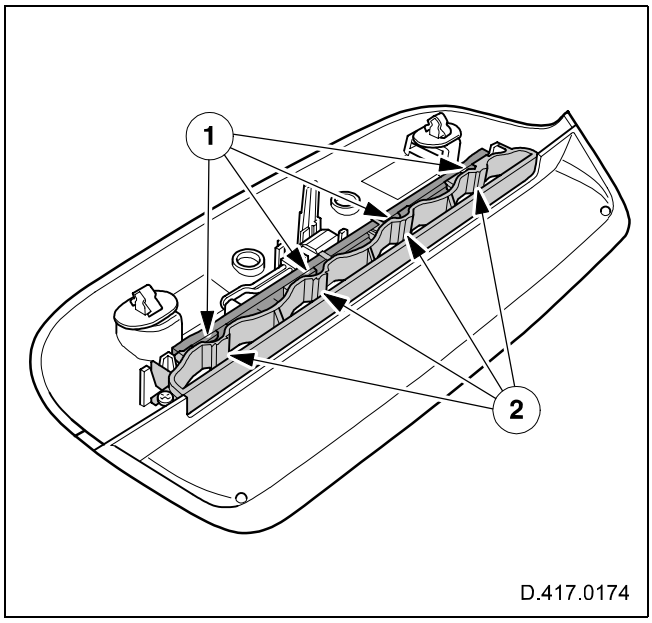


Fig. 116 High-mounted stop light

1. LEDs
2. Fresnel lens

Front and Rear Fog Lamp Switches

The switches are mounted within the auxiliary lighting switch assembly and intended to function as follows:

- Front fog lamps
  - The lamps are activated by 'pressing' the appropriate button, provided the SIDE LAMPS or LOW BEAM has been activated and the ignition key is at position 'II'.
  - The lamps are deactivated by pressing the same button.

NOTE: In some markets the front fog lamps will not operate if main beam is selected.

- Rear fog lamps
  - The lamps are activated by 'pressing'the appropriate button, provided that the LOW BEAM has been activated with the ignition key at position 'II' or the front fog lamps are already active.
  - The lamps are deactivated by pressing the same button.

NOTE: The rear fog lamps are not available for some markets.

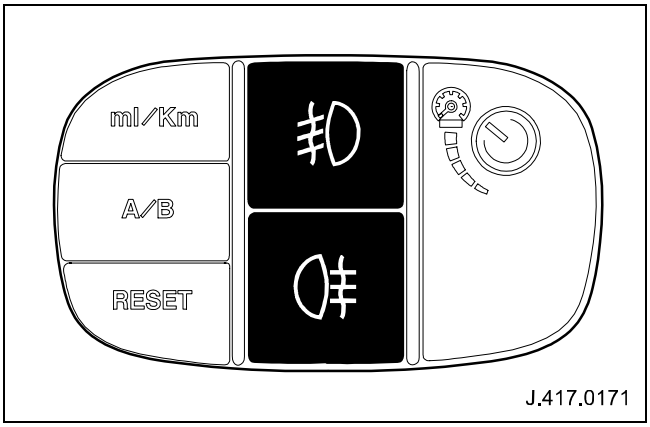


Fig. 117 Front and rear fog lamp switches

Refer to **New XJ Range Electrical Guide** for detailed electrical connection information.

Approach Lamps

Approach lamps are integrated in the exterior mirrors to provide ground illumination for the area around the front doors. Although the lamps are mounted externally, they are controlled by the interior lighting circuit: refer to **Interior Lighting**.

Interior Lighting

The interior lighting comprises:

- Footwell lamps.
- Puddle lamps.
- Courtesy lamps and switch.
- Front map lamps and switches.
- Vanity mirror lamps and switches.
- Rear map lamps and switches.
- Luggage compartment lamps.
- Glove compartment lamp and switch.
- Approach lamps

NOTE: Refer to **New XJ Range Electrical Guide** for detailed connection information.

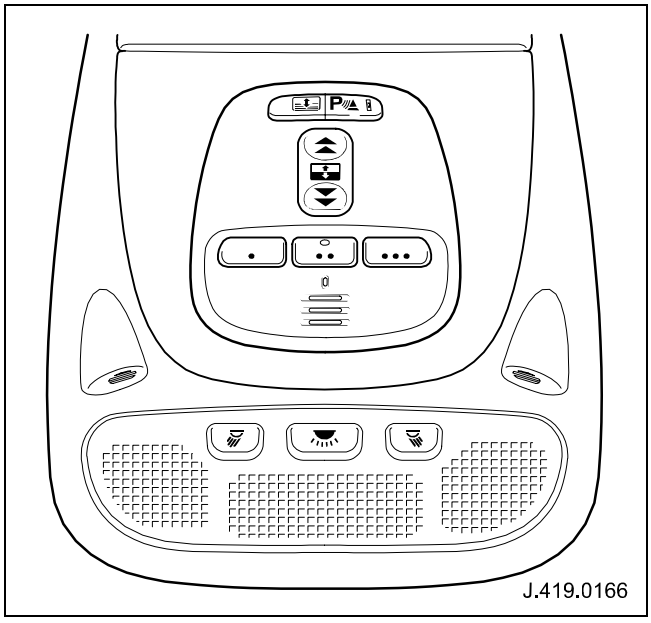


Fig. 118 Front interior lighting

Battery Saver

A timer function within the front electronic module (FEM) and rear electronic module (REM) controls the battery saver feature:

- The timer is initialized when the ignition key is turned to position '0' or removed from the ignition barrel.
- After a 40 minute period, the FEM and/or REM will remove the battery voltage from the interior lighting by deactivating the appropriate relays.

The battery saver feature will be reactivated when:

- The ignition key position is changed.
- Any door (including the luggage compartment door) becomes ajar or is opened.
- An external unlock is activated using either the door lock cylinder or the integrated key transmitter.
- The courtesy lamps' switch is activated.

Courtesy Lighting

The courtesy lamps are controlled by the front and rear electronic control modules in the following circumstances:

- Any of the vehicle's doors are open/closed.
- An external unlock is activated using either the door lock cylinder or the integrated key transmitter.
- The courtesy lamps' switch is activated.

Provided that the courtesy lamps' switch is not activated, the courtesy lighting feature extinguishes the courtesy lamps when all the vehicle's doors are closed and any of the following occurs:

- Fifteen seconds have elapsed since either an external unlock or the last door has closed, whichever occurs last.
- The engine is started.
- An external lock is activated using the door lock cylinder or integrated key transmitter.

In addition, the courtesy lighting feature extinguishes the courtesy lamps when the battery saver timer has expired; refer to **Battery Saver**.

During normal operation the courtesy lamps:

- Progressively illuminate when activated.
- Progressively extinguish when deactivated.

NOTE: When the battery saver feature is active the lamps will extinguish immediately.

Approach Lamps

Approach lamps are integrated in the exterior mirrors to provide ground illumination for the area around the front doors. The lamps are activated when:

- the vehicle is unlocked using the key, the key transmitter or the master locking switch;
- the headlamp convenience button on the key transmitter is pressed;
- reverse is selected.

NOTE: The approach lamps will not illuminate if the ambient light, as determined by the autolamp sensor, is above a predetermined level.

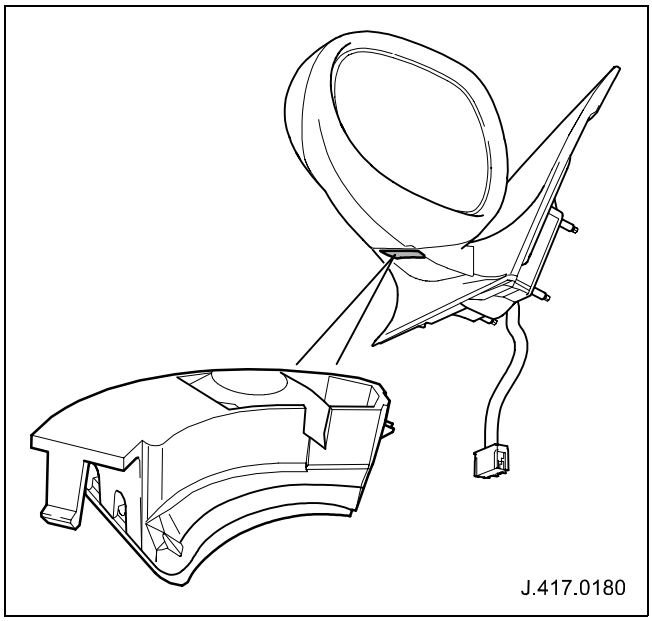


Fig. 119 Approach lamp

Electrical Distribution

Module Communications Network

The most significant change to the XJ distribution system is the introduction of optical fiber cables, which accommodate the transfer of very high-speed, real-time audio data.

The optical fibers provide an optical network that interfaces to the SCP network via the audio unit; refer to **D2B network** for detailed information.

NOTE: The optical network currently uses a transfer protocol known as D2B. Although this protocol may change in the future, the optical network will be referred to as 'D2B' throughout this and other Jaguar technical publications.

SCP, CAN and ISO9141 networks

The standard corporate protocol (SCP), controller area network (CAN) and ISO9141 networks are configured in a similar way to current Jaguar models to accommodate different data types and flow rates as required for the various vehicle features; refer to **Table 5**.

Network	Communication between	Speed (kbps)
CAN	Engine, Transmission, Braking System	500
SCP	Lower Speed Body Systems	41.6
ISO9141	Diagnostic connector and ECM; control modules with self-diagnostic capability not connected to CAN or SCP	10.4
D2B	Very high-speed, real-time audio data.	5500

Table 5 Network communication

Fig. 120 provides a representation of the major network interconnections; refer to **New XJ Range Electrical Guide** for detailed information.

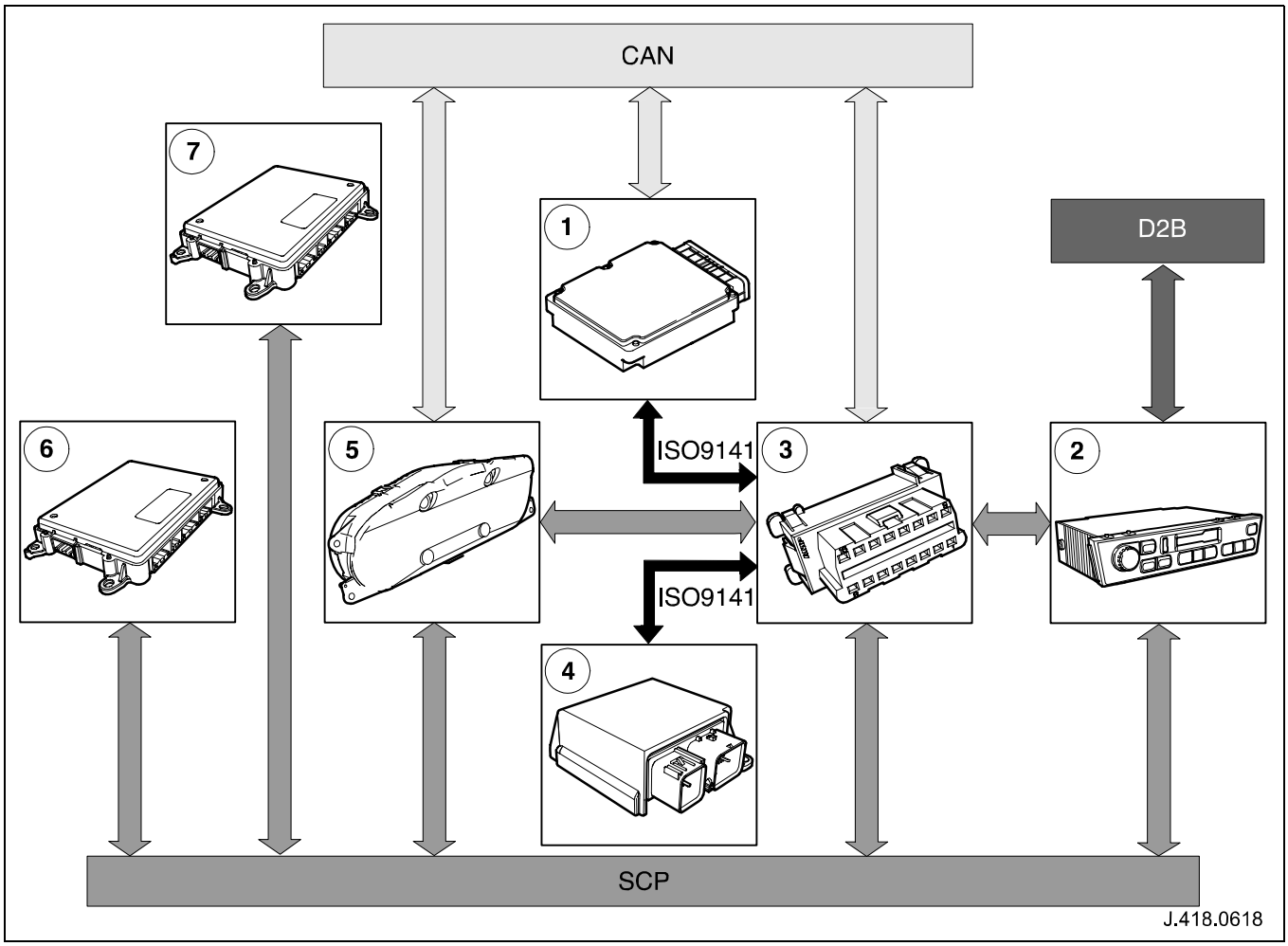


Fig. 120 Network interconnections

1. Engine control module
2. Audio unit
3. Diagnostic connector
4. Restraints control module
5. Instrument cluster
6. Front electronic module
7. Rear electronic module

Controller Area Network (CAN)

Fig. 121 provides a schematic representation of the CAN interconnections; refer to **New XJ Range Electrical Guide** for detailed information.

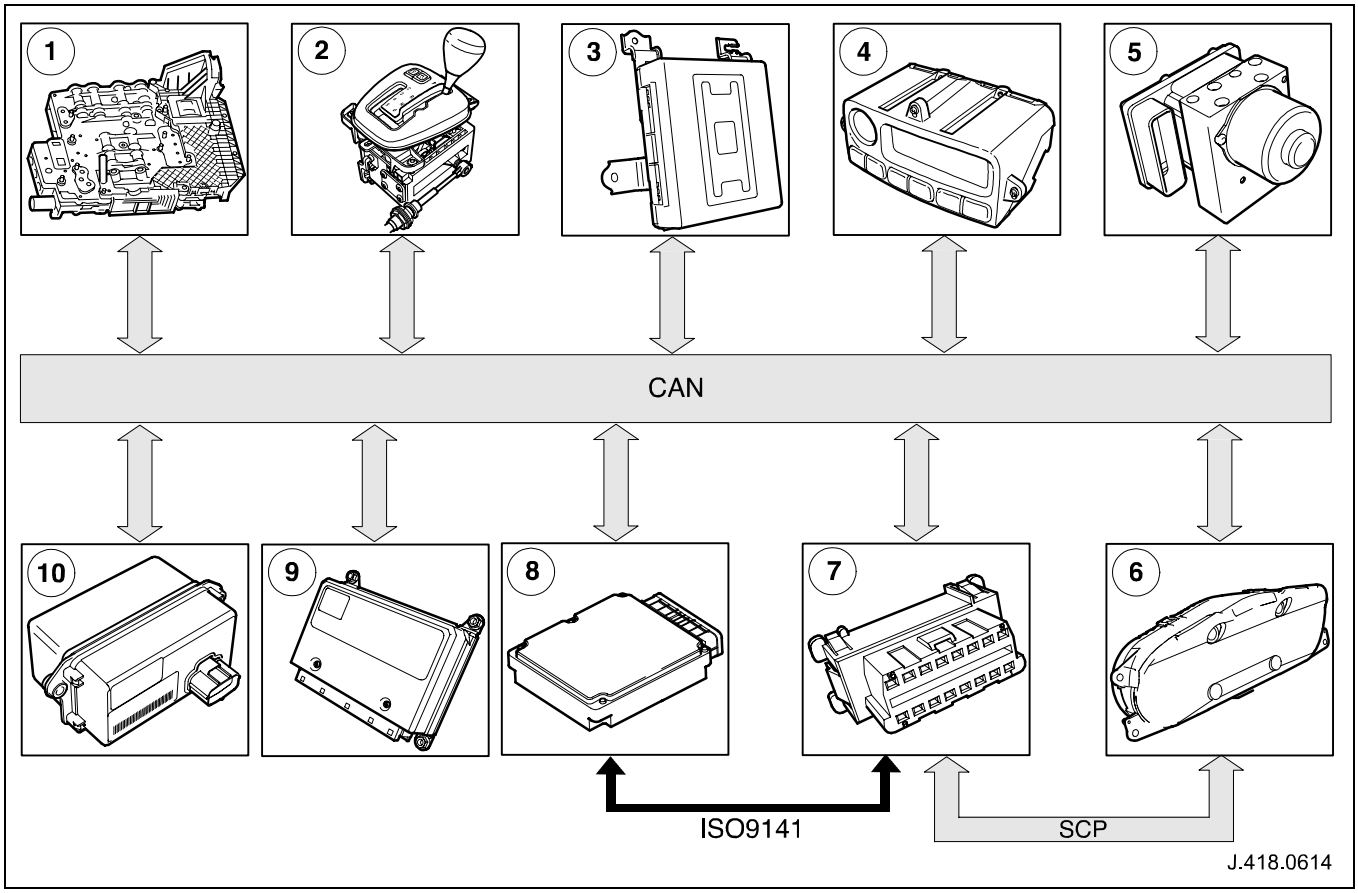


Fig. 121 Controller area network (CAN)

1. Transmission control module (and main control valve body)
2. J-gate module
3. Remote climate control module (telematics only)
4. Rear climate control panel
5. ABS module
6. Instrument cluster
7. Diagnostic connector
8. Engine control module
9. Air suspension module
10. Adaptive speed control module

Standard Corporate Protocol (SCP) Network

Fig. 122 provides a schematic representation of the SCP network interconnections; refer to **New XJ Range Electrical Guide** for detailed information.

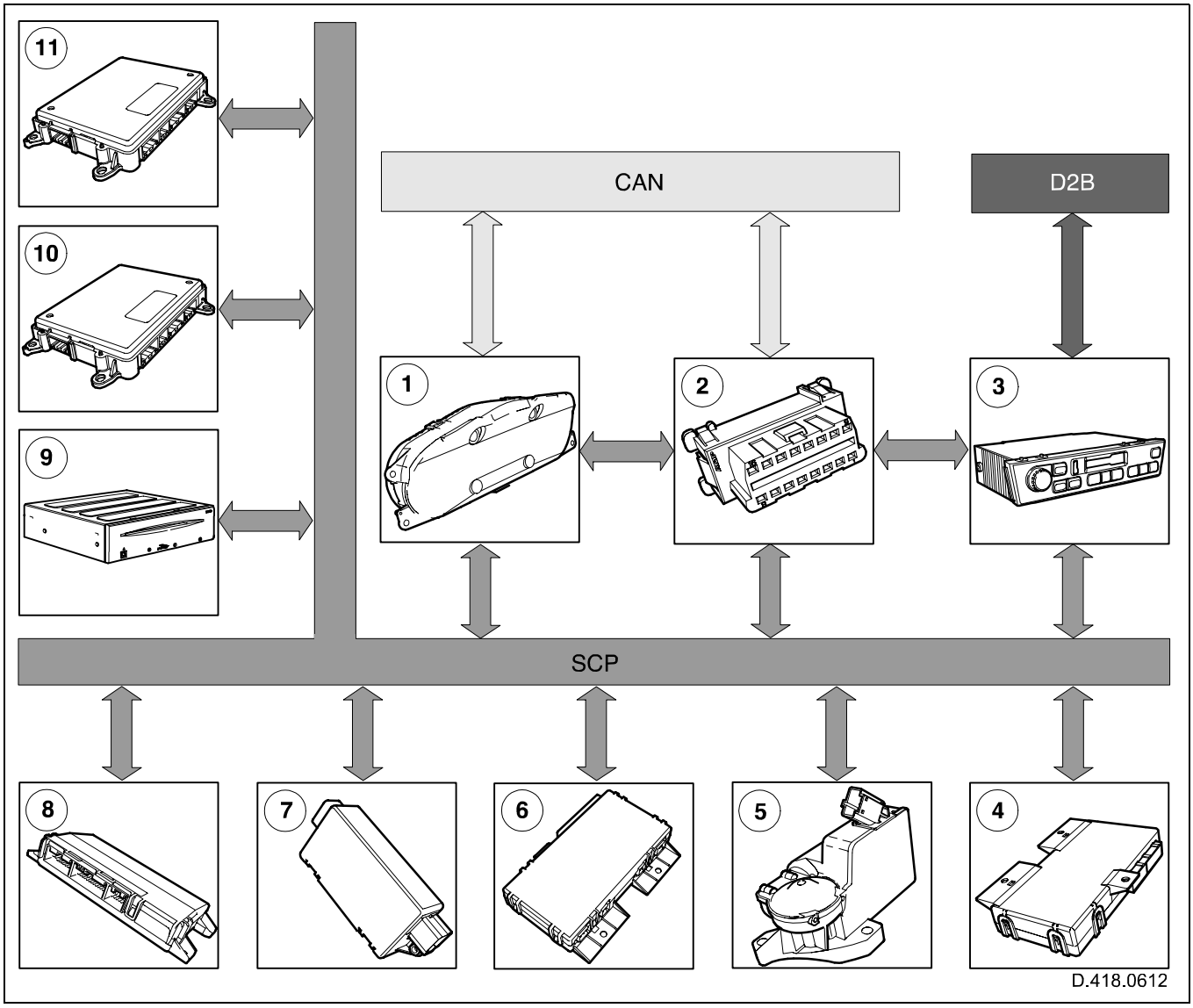


Fig. 122 SCP network

1. Instrument cluster
2. Diagnostic connector
3. Audio unit
4. Driver seat module
5. Steering column lock module
6. Rear memory module
7. Parking brake module
8. Driver door module
9. Navigation control module
10. Front electronic module
11. Rear electronic module

Network modules

Fig. 123 shows the main modules and locations; refer to the appropriate section and to **New XJ Range Electrical Guide** for detailed information.

NOTE: Refer to **Navigation System** for location of Navigation Control Module.

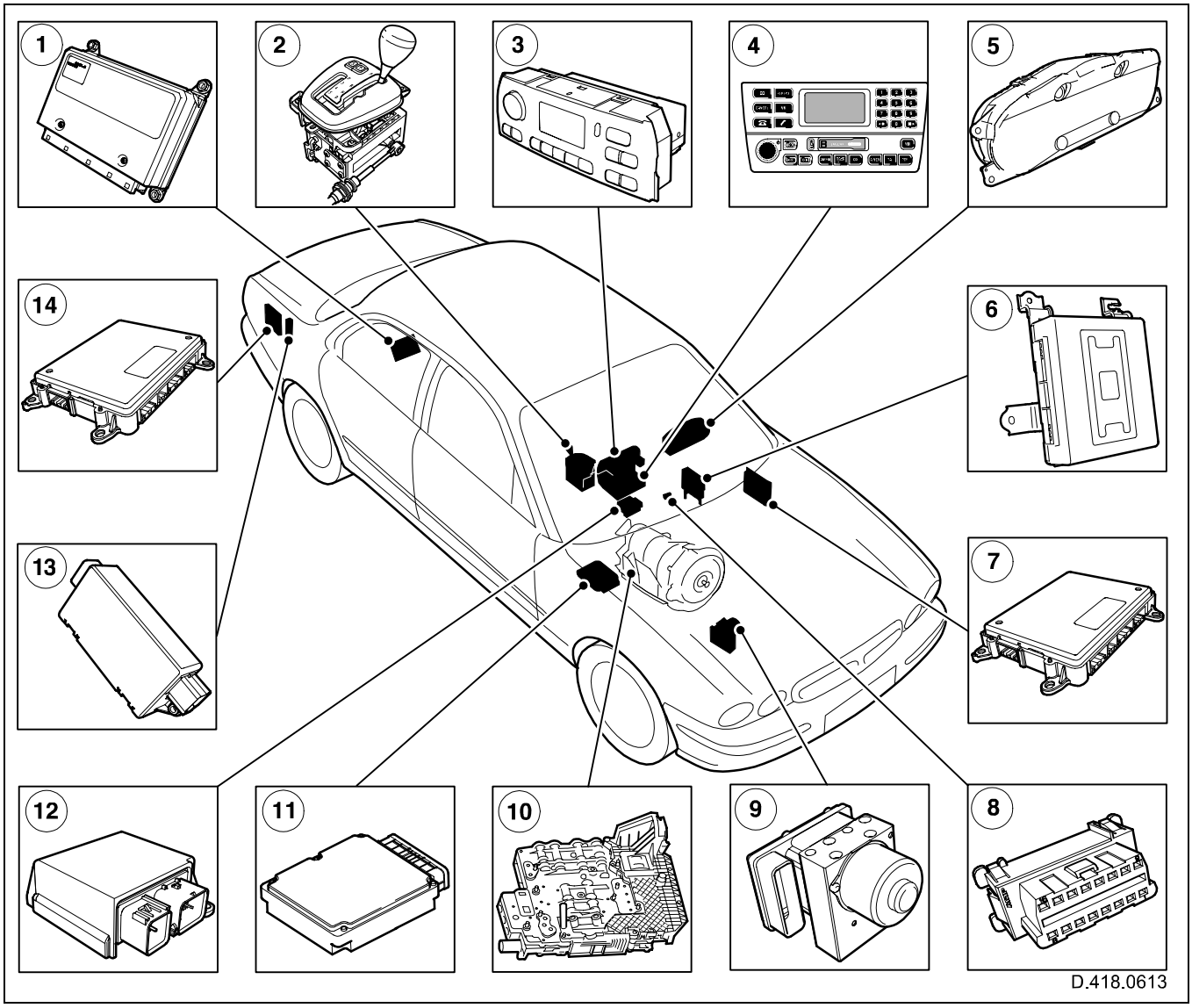


Fig. 123 Location of network modules

1. Air suspension module
2. J-gate module
3. Climate control module (non-telematics)
4. Audio unit (non-telematics)
5. Instrument cluster
6. Remote climate control module (telematics only)
7. Front electronic module
8. Diagnostic connector
9. ABS module
10. Transmission control module (and main control valve body)
11. Engine control module
12. Restraints control module
13. Parking brake module
14. Rear electronic module

D2B network

The D2B network comprises:

- Optical fiber.
- Wake-up wire.
- Master module (audio unit).
- Slave module(s).
- Intermediate connectors.

The network:

- is structured as a unidirectional ring;
- uses plastic optical fiber to transport data from one module to another in ring order.

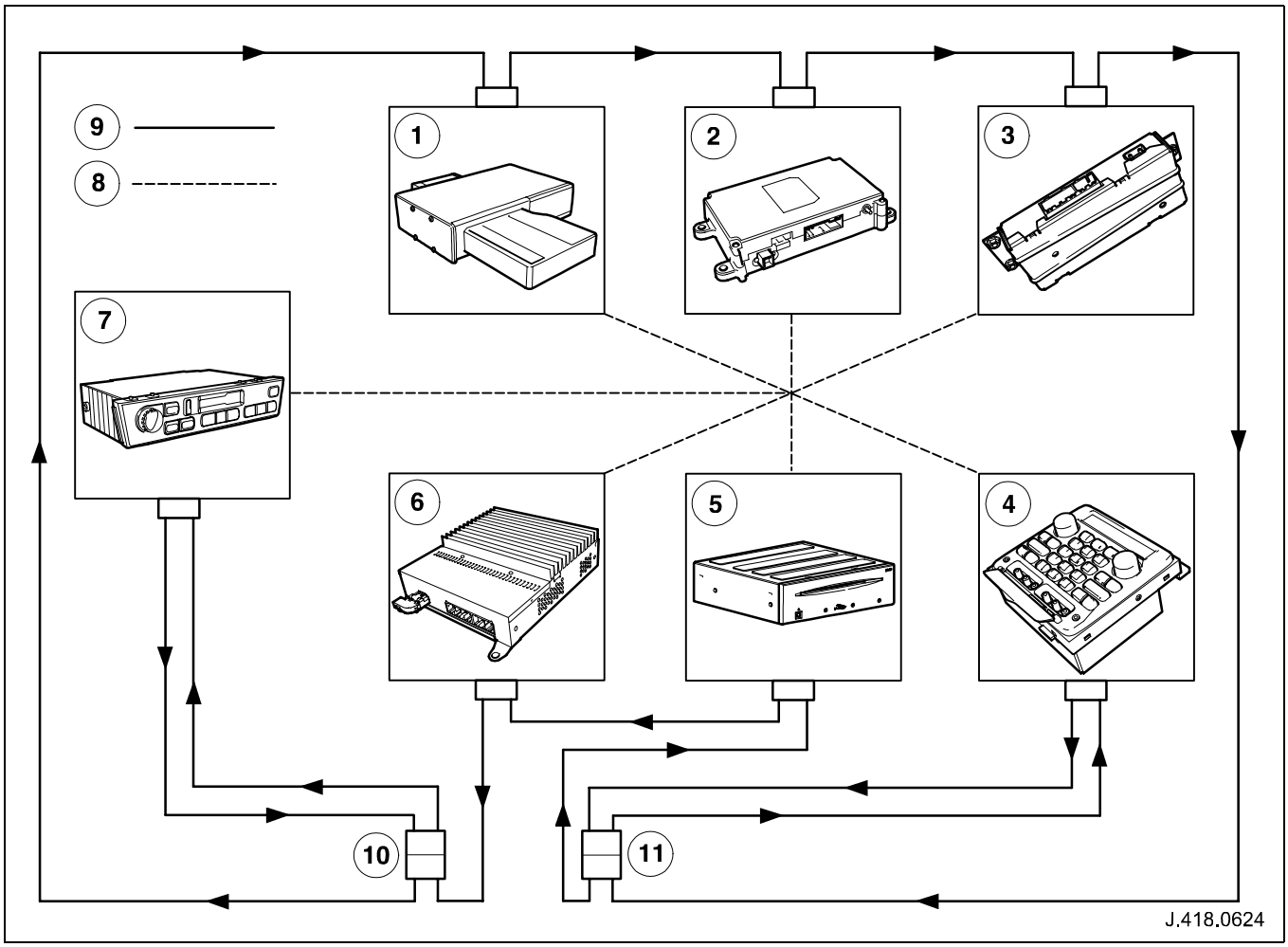


Fig. 124 D2B network

1. CD changer
2. Cellular phone control module
3. Voice activation control module
4. Passenger entertainment control panel
5. Navigation control module
6. Power amplifier (premium entertainment system)
7. Audio unit (master module)
8. Wake-up wire
9. Optical fiber
10. Intermediate connector 1
11. Intermediate connector 2

Optical Fiber

The fiber comprises a 1mm polymer core with a 3.5mm diameter outer protective jacket.

The fiber facilitates the transport of data in the form of pulses of light which are too fast to be seen by the eye, at a data bit rate of approximately 5.5M bits per second.

Wake-up Wire

The wake-up wire comprises copper wire configured in a star-like arrangement that connects to a single pin on each of the modules; refer to **Fig. 124**.

- The audio unit sends a wake-up command (an electrical pulse) via the copper wire to initialize the slave module(s).
- The wake-up pulse is sent when the ignition key is turned to position 'I'.
- The pulse triggers slave modules to look at the preceding module for a 'light signal' (originated by the audio unit) and to participate with the audio unit in network initialization.
- At the end of this initialization procedure, the modules are ready for full network operation.

NOTE: Any malfunction during the initialization stage will cause a DTC to be stored by the audio unit.

Master Module

The master module is the audio unit; it manages the D2B network and provides the gateway to the SCP network.

Slave Module(s)

A slave module is any other system module that is connected to the D2B network and includes:

- Navigation control module
- CD changer
- Cellular phone control module
- Voice activation control module

Intermediate Connectors

There are two intermediate connectors, one close to the j-gate (providing connection to the audio unit) and one located in the luggage compartment to the left-hand side (item 1, **Fig. 125**) that provides the interconnection point for the slave modules. Vehicles installed with rear multimedia system have two additional intermediate connectors, one close to the passenger entertainment control panel and one located in the luggage compartment to the left-hand side (item 2, **Fig. 125**) that provides the interconnection point for the slave modules.

NOTE: To install slave modules, follow the detailed **accessory fitting instructions** supplied with the modules.

Modules that connect to the D2B network, use special optical fiber assemblies which interface with the D2B intermediate connector in the luggage compartment; the assemblies may vary depending on the particular combination of modules connected to the network.

NOTE: Optical fibers are incorporated into the instrument panel and cabin harnesses during manufacture to support dealer installation of the CD changer, voice control and cellular phone systems.

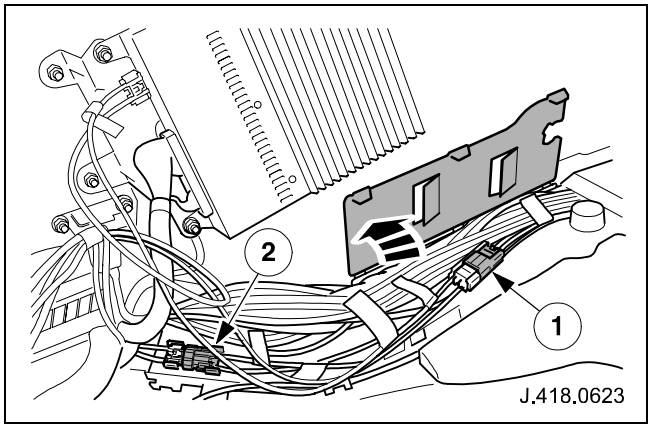


Fig. 125 Slave module intermediate connectors

1. Intermediate connector 1
2. Intermediate connector 2

Differences Between D2B and CAN or SCP

- D2B provides multiple communications channels instead of one channel.
- D2B has a control channel (which operates in a similar way to CAN or SCP) but in addition has three source data channels which can be used to transport up to three separate streams of 16-bit digital stereo data.

Optical Fiber Cables and Connectors

Under normal installation conditions, the system is robust and failures should not occur, however since the optical fibers convey data using light, it is vital that the passage of light down the fiber is unobstructed. Obstruction of light can be caused by:

- contamination of the fiber ends;
- damage to the fiber ends;
- bending, kinking or damaging the cable.

NOTE: Fibers damaged by kinking or exposure of the optical core due to abrasion must be replaced.

Handling

Take special care to avoid damage or contamination when handling or working in the vicinity of fiber optical cables and connectors.

NOTE: Damage or contamination includes scratches to the cable ends and pollution caused by dust, dirt or oil.

CAUTION: When handling optical fibers, cleanliness is of paramount importance. The fiber ends should not be touched even with clean bare hands, as the natural oils deposited from the skin may penetrate the fiber or may cause dirt to adhere to the fiber end.

System malfunctions and unnecessary warranty claims can be minimized by following these guidelines:

- After disconnection of any cables, carefully install an appropriate dust cap to protect the mating face of the connectors from damage or contamination.
- Avoid introducing tight bends (less than 25mm radius) or kinks into the optical fiber during service or repair. Tight bends or kinks could:
  - impair system operation;
  - cause immediate system failure;
  - cause future system failure.
- Avoid excessive force, strain or stress on the fibers and connectors, especially permanent stress after reinstallation.

Optical Network Diagnostics

Unlike the other networks that communicate with WDS via the diagnostic connector, the optical network interfaces with the diagnostic connector via the audio unit and the SCP network.

NOTE: Diagnosis and Testing is quite complex and specific; refer to **JTIS** for details.

Electronic Feature Group

Anti-Theft

NOTE: Refer to **New XJ Range Electrical Guide** for detailed electrical connection information.

Anti-theft options vary according to market and vehicle specification; typical options include:

- a perimeter alarm system;
- an intrusion sensing system;
- a passive anti-theft system (PATS).

Module Functionality

The anti-theft system incorporates the following modules, which all communicate via the SCP network:

- front electronic module (FEM);
- instrument cluster (IC);
- rear electronic module (REM);
- driver door module (DDM);
- steering column lock module (SCLM).

NOTE: Whenever a new REM or DDM is installed, in order to maintain correct communications between modules, the modules should be re-configured using WDS (follow ID transfer process).

In addition, where appropriate, the engine control module (ECM), based on messages exchanged via CAN, provides PATS security by disabling the starter relay, fuel injectors, ignition coils and the fuel pump module.

Front Electronic Module

NOTE: For functions not associated with anti-theft refer to **Multifunction Electronic Control Modules**.

The FEM monitors, depending on vehicle specification, the status of the following inputs:

- front passenger-door ajar switch;
- hood ajar switch;
- audio unit (anti-theft sensing line);
- telematics display (anti-theft sensing line);
- master lock switch;
- valet mode switch;
- luggage compartment-lid release switch (internal);
- fuel filler-flap release switch;
- glove compartment switch.

Depending on market specification and the alarm status, where appropriate, the FEM provides the necessary electrical output signals to the:

- vehicle horns, via the horn relay;
- front turn-signal indicator lamps, pilot lamps, side marker lamps.

NOTE: When commanded to do so by the instrument cluster, the FEM also provides the ground supply line for the SCLM.

Rear Electronic Module

NOTE: For functions not associated with anti-theft refer to **Multifunction Electronic Control Modules**.

The REM monitors the status of the following inputs:

- rear passenger door ajar switches;
- luggage compartment-lid ajar switch;
- intrusion sensors;
- inclination sensor;
- luggage compartment-lid release switch (external).

NOTE: The external luggage compartment lid-release cannot be activated unless the correct status is detected for the driver's door unlock latch, valet mode and transmission park.

Depending on market specification and the alarm status, where appropriate, the REM provides the necessary electrical output signals to the:

- passive sounder or battery-backed sounder (BBS);
- rear turn-signal indicator lamps, tail lamps, side marker lamps.

The REM has hard-wired, anti-theft sense-inputs from the FEM and the DDM. When commanded to do so by the instrument cluster, the REM also provides the power supply line for the SCLM.

NOTE: In addition to the functionality detailed above, on receipt of a request (from the FEM, via the SCP network), to release the fuel filler-flap the REM also provides an electrical output to drive the fuel filler-flap motor, provided the J-gate is in park.

Instrument Cluster

NOTE: For functions not associated with anti-theft refer to **Instrument Cluster**.

The instrument cluster:

- provides multiplex network gateway functionality for CAN and SCP;
- drives the anti-theft system indicator lamp;
- interfaces with the PATS transceiver coil;
- communicates with the ECM and key transponder (stores PATS key codes).
- interfaces with the electronic steering column lock module (SCLM).

Driver door module

NOTE: For functions not associated with anti-theft refer to **Multifunction Electronic Control Modules**.

The DDM where appropriate, monitors the status of the driver's door:

- unlocked switch;
- locked switch;
- ajar switch.

Except for Japan and Korea, the receiver for the remote transmitter is located in the DDM. Japan and Korea use a remote keyless entry (RKE) receiver, which interfaces to the DDM and is located behind the instrument cluster.

NOTE: The RKE receiver may be susceptible to RF interference in areas that have a high density of radio or mobile phone masts.

Steering column lock module

The SCLM is fixed to the upper steering column. Before the module can handle data it must have its power supply activated. When commanded to do so by the instrument cluster, the REM provides the power supply line and the FEM provides the ground supply line for the SCLM. Once activated, the module processes data on the SCP network and when appropriate, activates the motor to lock or unlock the steering column.

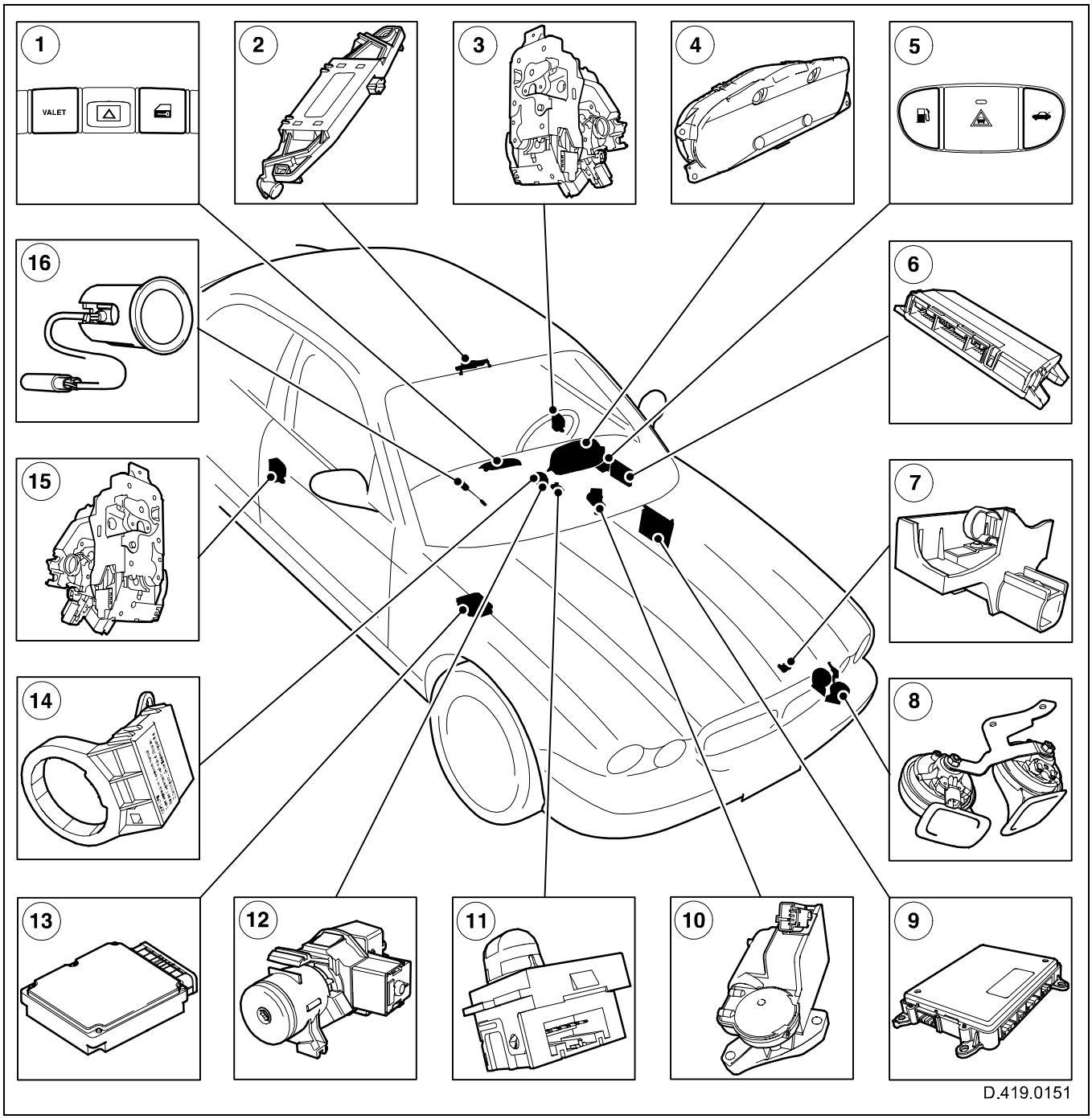


Fig. 126 Anti-theft component locations - front

Key to Fig. 126

1. Valet mode switch and master lock switch
2. Intrusions sensors (where applicable)
3. Driver door ajar switch
4. Instrument cluster
5. Fuel filler-flap release switch and luggage compartment-lid release switch
6. Driver door module
7. Hood ajar switch
8. Horns
9. Front electronic module
10. Steering column lock module (where applicable)
11. Anti-theft system indicator lamp
12. Ignition switch
13. Engine control module
14. Transceiver coil
15. Passenger door ajar switch
16. Glove compartment switch

Although part of the anti-theft system, for clarity of illustration, the following components have not been included:

- Integrated key transmitter.
- Turn signals, pilot, tail and side marker lamps.
- J-gate interlock.
- Driver's door key barrel.
- Remote keyless entry receiver (where applicable).

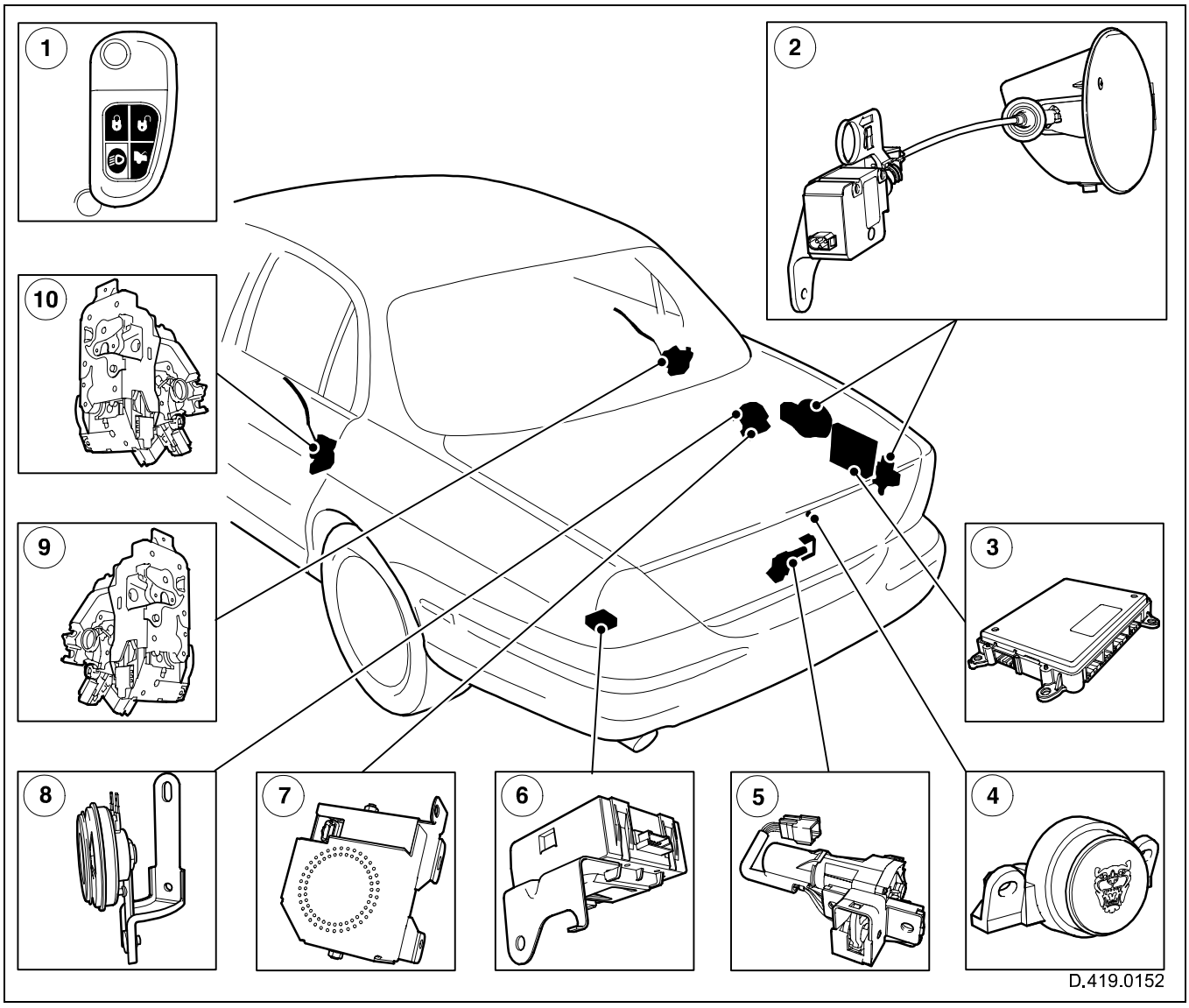


Fig. 127 Anti-theft component locations - rear

1. Integrated key transmitter
2. Fuel filler-flap release assembly
3. Rear electronic module
4. External luggage compartment-lid release switch
5. Luggage compartment lid-ajar switch
6. Inclination sensor (where applicable)
7. Battery-backed sounder (where applicable)
8. Passive sounder (where applicable)
9. RH rear passenger door ajar switch
10. LH rear passenger door ajar switch

System Features

Depending on market specification, the following features may be incorporated as either standard or dealer installed options:

Passive anti-theft system

- Encrypted instrument cluster/engine control module immobilization system, controlled by the ignition key transceiver/transponder.

Vehicle and passenger compartment security

- Key barrel on the driver's side only.
- Radio frequency remote transmitter (part of integrated key transmitter).
  - Four control buttons (lock, unlock, luggage compartment-lid release, headlamp convenience / panic).
- Double locking by key and remote transmitter (not Japan or NAS vehicles).
- Central locking by key, remote transmitter and interior handle.
- Auto-relocking (dealer programmable).
- Drive-away locking (standard, except Japan).
- Two-stage unlocking (certain markets).
- Steering column lock (certain markets).
- Passive arming (dealer programmable).
- Ignition key-barrel interlock (mechanical or electrical depending on market).
- J-gate interlock.

Master lock functionality

The master lock switch can be used to:

- centrally lock or unlock the vehicle; this feature can also be controlled by the remote transmitter (where applicable) or from the driver's door key barrel;
- initiate global closing or global opening of windows or roof opening panel;
- disable the intrusion sensing and inclination sensing (where applicable).

NOTE: To avoid false alarms when transporting the vehicle particularly by ferry in severe weather conditions, the intrusion sensing and inclination sensing can be disabled for one arm-cycle.

Provided all windows are fully closed and the ignition key is at position '0' or removed from the ignition, the sensors can be disabled by pressing the master lock switch. The anti-theft system indicator lamp will flash five times to confirm the sensors are disabled.

Compartment security

- Electrically secured glove compartment.
- Electrically secured fuel filler-flap.
- Internal luggage compartment-lid release.
- External luggage compartment-lid release.
- Valet mode.

The glove and luggage compartments are secured by remote locking, driver's key barrel locking or by selecting valet mode. Selection of valet mode is confirmed by an audible warning or if the ignition key is at position 'II', the instrument cluster will display a status message. Once valet mode has been selected, a valet chime (or message, depending on the status of the ignition) will confirm that access is denied when any of the following buttons are pressed:

- valet mode;
- glove compartment;
- external luggage compartment-lid release;
- internal luggage compartment-lid release.

The valet mode can only be cancelled by using the:

- remote unlock;
- integrated key or the black-headed key to directly open the luggage compartment.

NOTE: Opening the luggage compartment using the release button on the integrated key transmitter does not cancel the valet mode.

Sensing and indication

- Anti-theft system indicator lamp - indicates system is armed and PATS fault codes.
- Perimeter sensing for doors, hood and luggage compartment lid.
- Removal sensing for audio unit and telematics display (where applicable).
- Intrusion sensing (where applicable).
- Inclination sensing (dealer installation).
- Separate anti-theft horn or battery backed sounder (market dependent).

Remote control features

- Panic alarm - remote transmitter operated (standard for NAS markets, otherwise dealer programmable).
- Remote two-stage toggle (standard worldwide, except Japan).

Definition of terms

- Double-locking - the vehicle cannot be unlocked via the interior door handles.
- Drive-away locking - the doors will lock automatically when the gearshift lever is moved for one second or more, from position 'P' or 'N' into position 'D' or 'R'.
- Auto-relocking - provided the anti-theft feature is enabled and the vehicle has previously been locked and armed, after unlocking the vehicle using the integrated key transmitter, the doors will automatically lock and the system re-arm after 45 seconds providing the:
  - hood, trunk lid or any door, has not been opened;
  - ignition key has not been inserted into the ignition key barrel;
  - key barrel unlock or lock operation has not occurred.

- Two-stage unlocking can be achieved by using either the integrated key transmitter or the key in the barrel lock:
  - the first-stage unlock operation, unlocks only the driver's door;
  - the second-stage unlock operation, unlocks the remaining doors.
- Remote two-stage toggle - allows the vehicle owner to switch the unlocking preference between 'central unlocking' and 'two-stage unlocking'.
  - Simultaneously pressing for 4 seconds, the lock and unlock buttons on the integrated key transmitter, toggles locking from the current condition to the alternative condition. Each repetition of the operation will revert locking to the former condition.

  NOTE: Two-stage unlocking can also be activated or deactivated after accessing the 'vehicle settings' from the 'system setup' menu using the telematics screen (where applicable).

System Arming And Disarming

NOTE: The following details are market dependent.

The anti-theft system is armed by locking the vehicle using the driver's door key or by pressing the 'lock' button on the integrated key transmitter.

- Pressing the 'lock' button on the integrated key transmitter once, or locking the driver's door with the key, activates the perimeter sensing.
- Pressing the 'lock' button on the integrated key transmitter twice, or completing the driver's door unlock and lock operation with the key, within 3 seconds (where applicable):
  - activates the perimeter and intrusion sensing;
  - activates the inclination sensor;
  - invokes double-locking.

NOTE: There is no pre-arm phase when the vehicle is double locked.

Once the pre-arm phase (20 seconds after locking) has passed (or double-locking action occurs) and provided no closures remain ajar, the vehicle becomes fully armed (depending on market and vehicle specification). Once fully armed, any of the following will trigger an alarm:

- Opening a door/hood/luggage compartment lid (unless via integrated key transmitter).
- Turning an invalid PATS ignition key to position 'II'.
- Movement inside the vehicle (providing intrusion sensors are installed and the vehicle is double locked).
- Excessive movement of vehicle (providing inclination sensor is installed and the vehicle is double locked).
- Removal of modules, including audio unit or telematics display.
- Disconnection of the battery-backed sounder.

NOTE: Disconnection or interruption of the battery supply also activates the battery-backed sounder (where applicable).

When the alarm is activated, a visual warning is provided by the turn signals and an audible warning by the vehicle horns. Where installed, the passive sounder or battery-backed sounder, provide an additional audible warning.

NOTE: In some markets, pilot, side and tail lamps provide additional or alternative visual indication.

The anti-theft system can be disarmed by unlocking the driver's door lock (not European or Middle East vehicles), pressing the unlock button on the integrated key transmitter, or inserting and turning a valid ignition key to position 'II'.

Locking Error Codes

Error codes are standard for all vehicles with an anti-theft system installed. The error codes, in the form of tones (two chirps) or flashes (five flashes of the turn signals) are evident when an attempt is made to lock the vehicle using the integrated key transmitter or using the key in the driver's door lock in the following circumstances:

- a door is ajar;
- the luggage compartment lid is ajar;
- the hood is ajar;
- a key is in the ignition.

NOTE: If door key operation occurs (and the key is not in the ignition), the arming sequence will be completed, followed by the error codes. Should the key be in the ignition, the arming sequence will fail and an error code will be transmitted.

Failure of an intrusion sensor or inclination sensor (where applicable) is confirmed when unlocking after double lock, by error tones (two chirps) or flashes (six flashes of the turn signals).

Telematics

Telematics refers to the convergence of telecommunications and information technology within the vehicle, enabling the seamless transport of information and data to provide various services to and from the vehicle (or mobile communications devices).

Telematics Display Module

The telematics display module is the principle user interface for the following subsystems:

- Navigation; refer to **Navigation System**.
- Climate control; refer to **Climate Control System**.
- Entertainment; refer to **In-vehicle Entertainment Systems**.
- Cellular phone; refer to **Cellular Phone**.
- Television (optional); refer to **Video System**.
- Voice training modes (optional): refer to **Voice Activated Control System**.

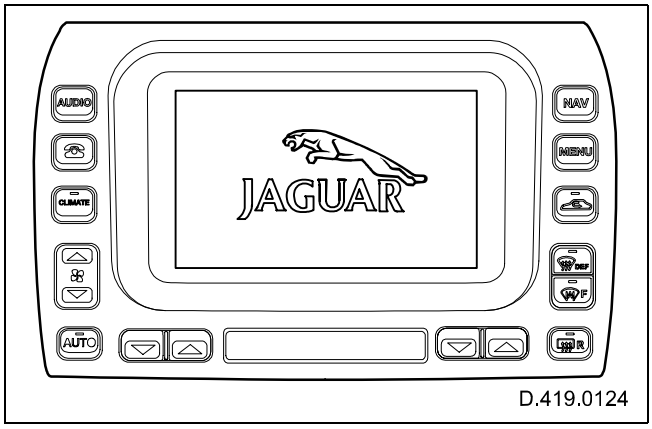


Fig. 128 Telematics display module

When the ignition key is at position 'I' or 'II' the touch-screen will display the Jaguar leaper followed by the last 'top level' menu of the screen used before the ignition key was turned to position '0'. Display of touch-screen options for other systems is obtained by pressing the appropriate perimeter button.

NOTE: The touch-screen and inner bezel must be kept clean to maintain optimum performance. Finger marks and attracted dust should be regularly removed using a soft cloth and a Jaguar approved cleaning agent.

Touch-screen features are designed to be user-friendly and intuitive like a personal computer. The tables show typical examples of the text displayed using the screen menus.

MENU		
Brightness/Contrast	Volume	TV
System Setup	Rear Multimedia	
Screen Off	Logo Screen	

Table 6 Menu text displayed

SYSTEM SETUP	Cancel
Vehicle Settings	
User Settings	

Table 7 System setup text displayed

USER SETTINGS			
Audible Feedback	All	Touch Screen	None
Language	Flag Change		
Navigation units	Metric	Imperial	
			OK

Table 8 User settings displayed

Voice Activated Control System

NOTE: The system will not operate until the audio unit security code has been entered.

The voice activated control system, offers the user the option to activate by voice, certain features for the following systems:

- Entertainment.
- Cellular phone.
- Climate control.
- Television (where installed) and teletext (where available).
- Navigation.

NOTE: The navigation 'Caution Screen' must be cleared after every ignition cycle, before the navigation system will respond to any voice commands issued.

NOTE: Vehicles are pre-wired during manufacture to facilitate, in appropriate markets, the dealer installation of the voice activation control system, as an accessory.

The system components comprise:

- Voice activation module (VAM), located in the luggage compartment to the left-hand side and mounted to the stack-bracket that is shared with the multimedia modules.
- Microphone, shared with the phone and located in the overhead console.
- Push-to-talk button, mounted on the steering wheel, shared with the phone and wired through the audio unit.

NOTE: Where applicable, providing the parking brake is engaged, it is possible to initiate a training mode which enables the voice activation control system to fine-tune the voice recognition capability.

The VAM is not serviceable but will need to be reconfigured using WDS if changes are made to the systems it controls; for example, after the installation of a CD changer.

NOTE: VAM is part of the optical network; refer to **D2B network**.

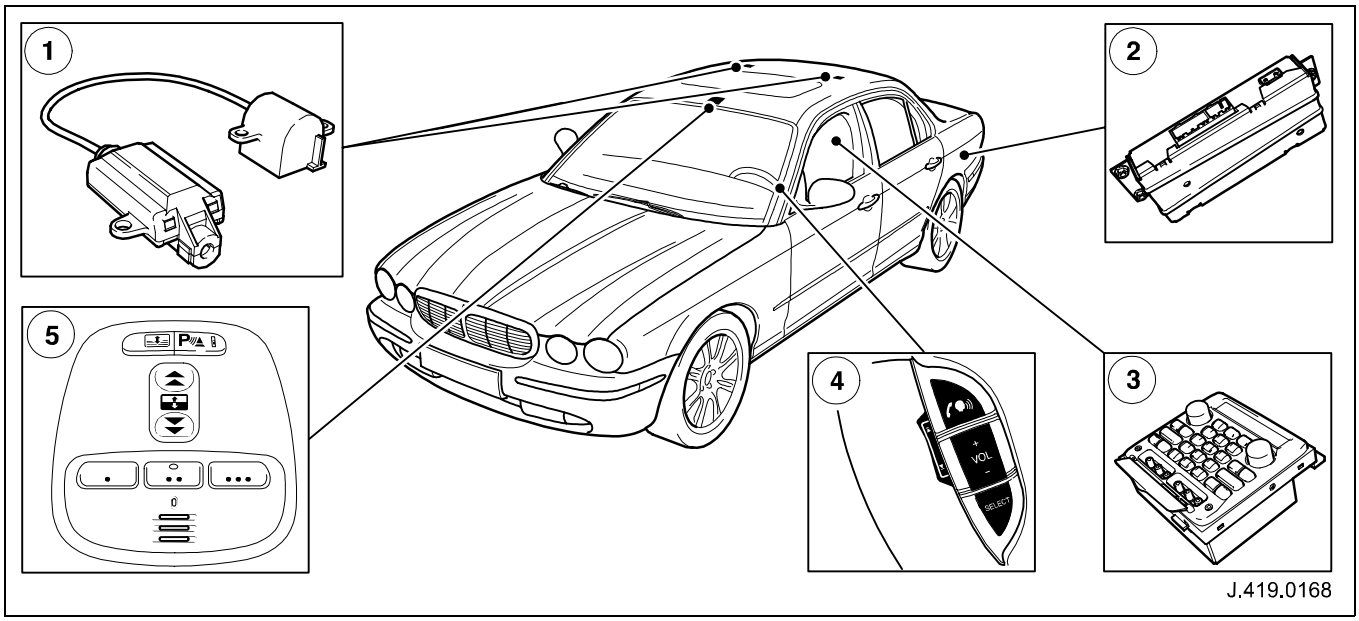


Fig. 129 Voice-activated control - component locations

1. Rear microphone
2. Voice activation module
3. Passenger entertainment control panel
4. Push-to-talk button
5. Front microphone

Provided the multi-zone voice option is installed, voice activated control for most functions may be achieved by rear seat passengers:

- Two microphones are located in the headliner, one above each of the rear passenger seat positions.
- Voice activation can be initialized by pressing one of the 'TALK' buttons on the passenger entertainment control panel.
- For a voice command to be successful, the rear multimedia system must be in the mode that will direct audio to the device selected: 'LEFT' headset, 'CABIN' speakers or 'RIGHT' headset.
- Selection of the mode is confirmed by the illumination of the tell-tale LED on the corresponding button.

NOTE: To allow a voice command to be issued, currently active audio will be temporarily muted.

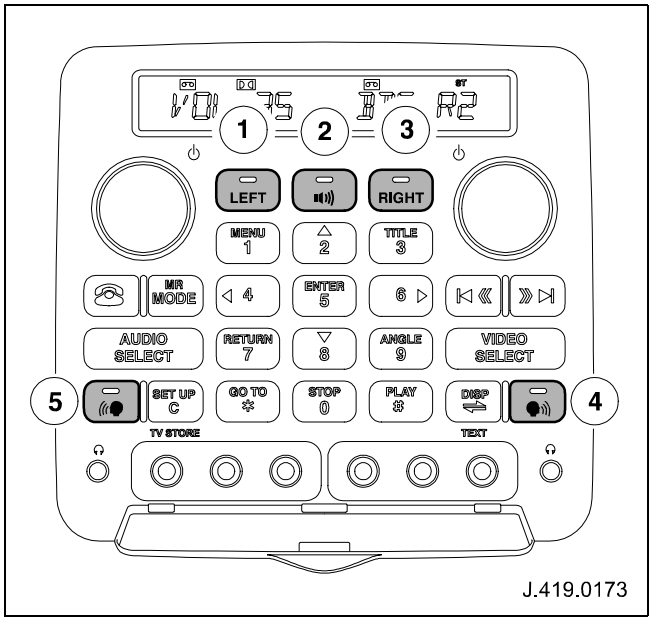


Fig. 130 Rear voice activation - control buttons

1. LEFT headset select
2. CABIN speakers select
3. RIGHT headset select
4. Right TALK select
5. Left TALK select

Navigation System

The navigation system comprises:

- Navigation control module complete with map data DVD reader.
- Navigation system antenna.
- Navigation map data DVD.
- Navigation system display module.

NOTE: The navigation system uses the **Telematics Display Module** as the navigation system display module; refer to the appropriate section for more information.

The vehicle location/direction is determined using the following:

- global positioning system (GPS);
- vehicle speed;
- gyroscope to detect directional changes; refer to **Navigation Control Module**;
- navigation map-matching software integral to the **Navigation Control Module**;
- navigation data stored on the DVD disc.

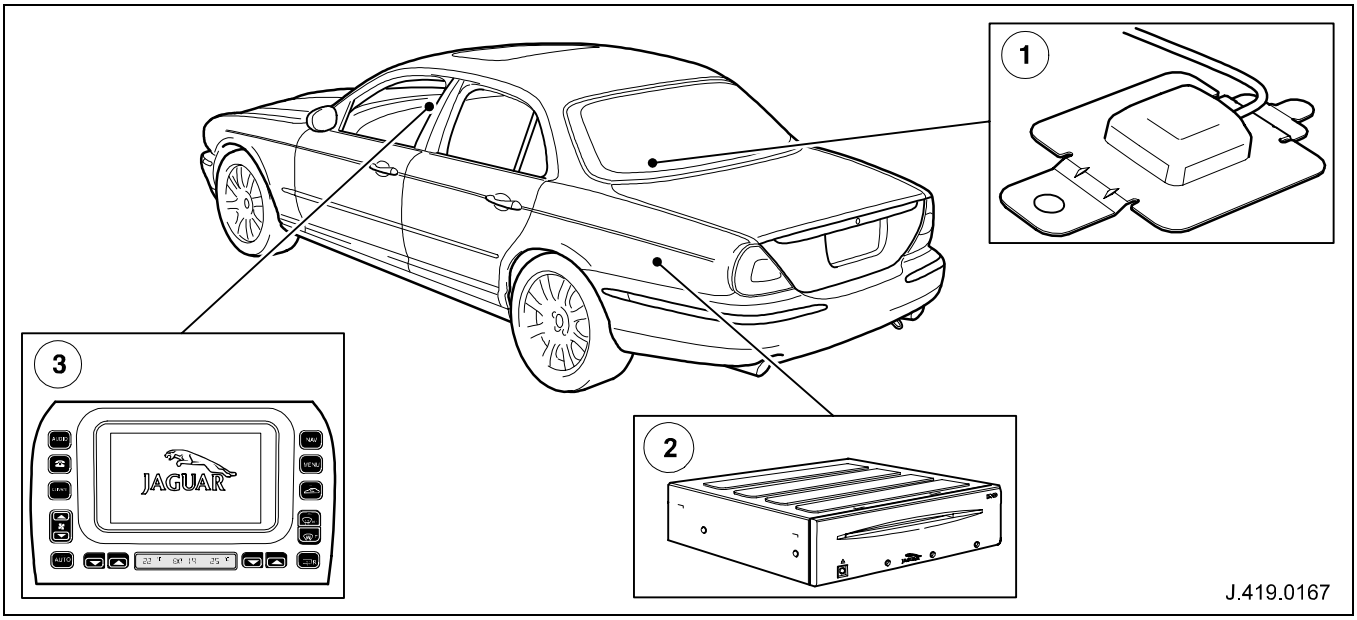


Fig. 131 Navigation system component location

1. Navigation system antenna
2. Navigation control module
3. Telematics display module

Navigation Control Module

The NCM is:

- located in the luggage compartment to the left-hand side;
- fixed to a bracket which also supports (where applicable) other multimedia modules.

The navigation control module (NCM) comprises:

- Navigation software which controls:
  - generation of map display;
  - routing functions.
- Graphics display driver.
- D2B output of audio data for voice guidance and television.
- SCP link for communications between other modules.
- Subsystem control software to generate control screens for other modules and support communications.
- GPS decoder which amplifies and decodes the GPS signal received from the antenna.
- Gyroscope to monitor vehicle direction.
- DVD drive which reads the map database stored on disc.
- Diagnostic software.

NOTE: Japan uses a different NCM that incorporates a Japanese voice activation module (VAM). The module permits extensive recognition of navigation system commands (including the ability to enter full addresses) and the display of traffic information via vehicle information communications system (VICS).

Navigation System Display Module

The display module is a multifunction touch-screen console which comprises on-screen simulated buttons (soft buttons) and perimeter buttons (hard buttons). Unlike some Jaguar models, the display module is not dedicated to navigation, it is also the principal interface for several subsystems; refer to **Telematics Display Module**.

Navigation System Antenna

The navigation system antenna is a satellite GPS type that is mounted on the parcel shelf to optimize reception. A coaxial cable links the antenna module to the NCM and:

- provides 5V dc power from the NCM to the active receiver circuits of the antenna via the inner coaxial conductor;
- transfers incoming signals from the antenna to the NCM.

NOTE: Signal reception may be affected by the presence of: metal objects or foil, on or near the parcel shelf or rear glass; metallic screen-coatings on the rear glass.

Cellular Phone

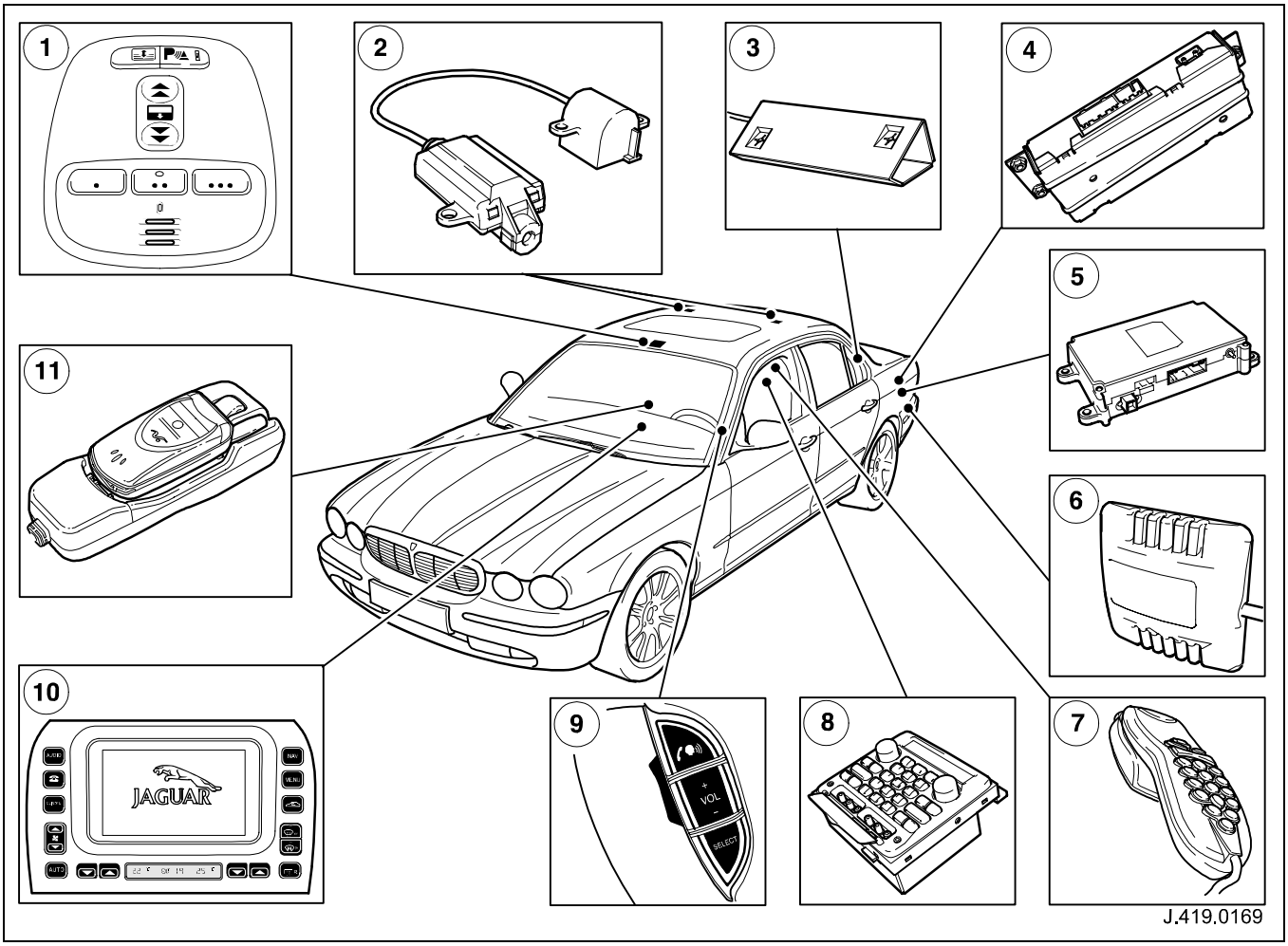


Fig. 132 Cellular phone system component location

1. Front microphone (option)
2. Rear microphone (option)
3. Cellular phone antenna (NAS)
4. Voice activation module (option)
5. Cellular phone control module
6. Cellular phone antenna (GSM)
7. Cellular phone handset and cradle (GSM)
8. Passenger entertainment control panel (option)
9. Steering wheel telematics controls
10. Telematics display module (option)
11. Cellular phone handset (NAS)

The cellular phone system is market dependent and comprises the following:

- Cellular phone control module.
- Cellular phone antenna.
- Cellular phone handset and cradle.
- Steering wheel telematics controls.
- Remote keypad.

NOTE: The remote keypad for the cellular phone is dependent on the vehicle specification; it is selectable from the telematics display module (where installed) or integral to the audio unit (non-telematics version); refer to **Audio Unit** for details.

Hands-free operation of the phone is possible by the addition of a microphone (part of the overhead console) and the voice activation module (VAM); refer to **Voice Activated Control System**.

Cellular Phone Control Module

The CPCM is market dependent and:

- located in the luggage compartment to the left-hand side;
- fixed to a bracket which also supports (where applicable) other multimedia modules;
- has one electrical connector, one optical connector;
- has one antenna connector (GSM only).

NOTE: The NAS antenna connects directly to the hang-up cup.

Steering Wheel Telematics Controls

To ensure minimum disruption to concentration when driving, limited control of audio, telephone and voice activation systems is possible using the steering wheel telematics controls.

The controls provide the following phone functionality:

- Answer phone call/end hands-free calls.
- Increase or decrease volume.
- Selection of phone ready mode.
- Cycle through phone memory.

Rear Cellular Phone

The rear cellular phone facility is a dealer-installed option, subject to market and vehicle specification.

- Vehicles installed with twin rear seats and rear floor console have the phone fitted to the rear console lid.
- Vehicles installed with the fold-down armrest have the phone installed within the armrest.

To facilitate conference calls, hands-free operation of the phone is possible by the addition of multizone voice option, which comprises two microphones (located in the headliner, one above each of the rear passenger seat positions), the voice activation module (VAM); refer to **Voice Activated Control System** and the passenger entertainment control panel; refer to **Rear Multimedia System**.

The appropriate microphone is selected by pressing the left or right-hand 'TALK' button on the passenger entertainment control panel during a call. The active microphone is indicated by the illumination of the tell-tale LED in the 'TALK' button.

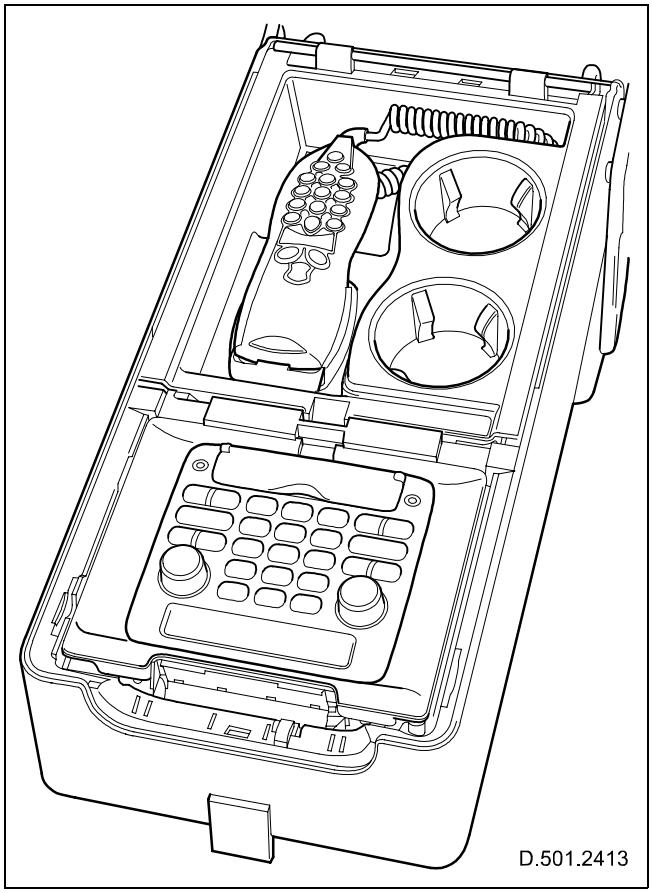


Fig. 133 Rear armrest (without covers)

Multifunction Electronic Control Modules

Front Electronic Module

The front electronic module (FEM) is located at the base of the left-hand side A-post.

There are five electrical connectors each with unique keyways.

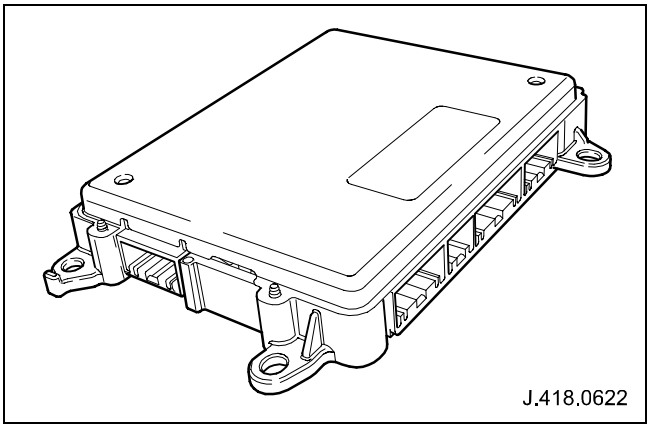


Fig. 134 Front electronic module

The FEM communicates via the SCP network, is configured for market options and where appropriate controls or provides an interface for the following major functions:

- Easy entry-easy exit lighting.
- Courtesy / demand lighting.
- Front exterior lighting.
- Turn signals and hazard warning lamps.
- Daytime running lamps.
- Battery saver (interior lights).
- Adjustable pedals.
- Fluid and pressure metrics (low washer fluid, low oil pressure).
- Memory functions.
- Front heated seats.
- Security; refer to **Anti-Theft**.

Rear Electronic Module

The rear electronic module (REM) is located to the right-hand side of the luggage compartment, behind a trim panel.

The REM communicates via the SCP network, is configured for market options and where appropriate controls or provides an interface for the following major functions:

- Inertia switch operation (disables fuel pump driver and triggers door unlock command).
- Fuel pump driver circuit and fuel level indication.
- Exterior rear lamps, park, fog, stop, turn, hazard, reversing lamps.
- Rear heated seats.
- Luggage compartment lid release.
- Trailer functionality.
- Electrochromic mirror operation (reverse).
- Security; refer to **Anti-Theft**.

Driver Door Module

The driver door module (DDM) is matched to the operating frequency of the appropriate market and located in the driver's door.

The DDM communicates via the SCP network, is configured for market options and where appropriate controls or provides an interface for the following functions:

- RF decoder for remote keyless entry; refer to **Anti-Theft**.
- Three personality configurations linked to the memory feature.
- Power windows.
- Driver mirror.
- Exterior mirror movement
- Power locks/automatic door locks
- Easy entry/exit
- Horn chirp

Body Construction

The body is a monocoque structure, designed from aluminum to provide the following benefits:

- Reduce the weight of the vehicle bodyshell by approximately 40%.
- Improve fuel economy and vehicle performance.
- Provide enhanced corrosion protection.

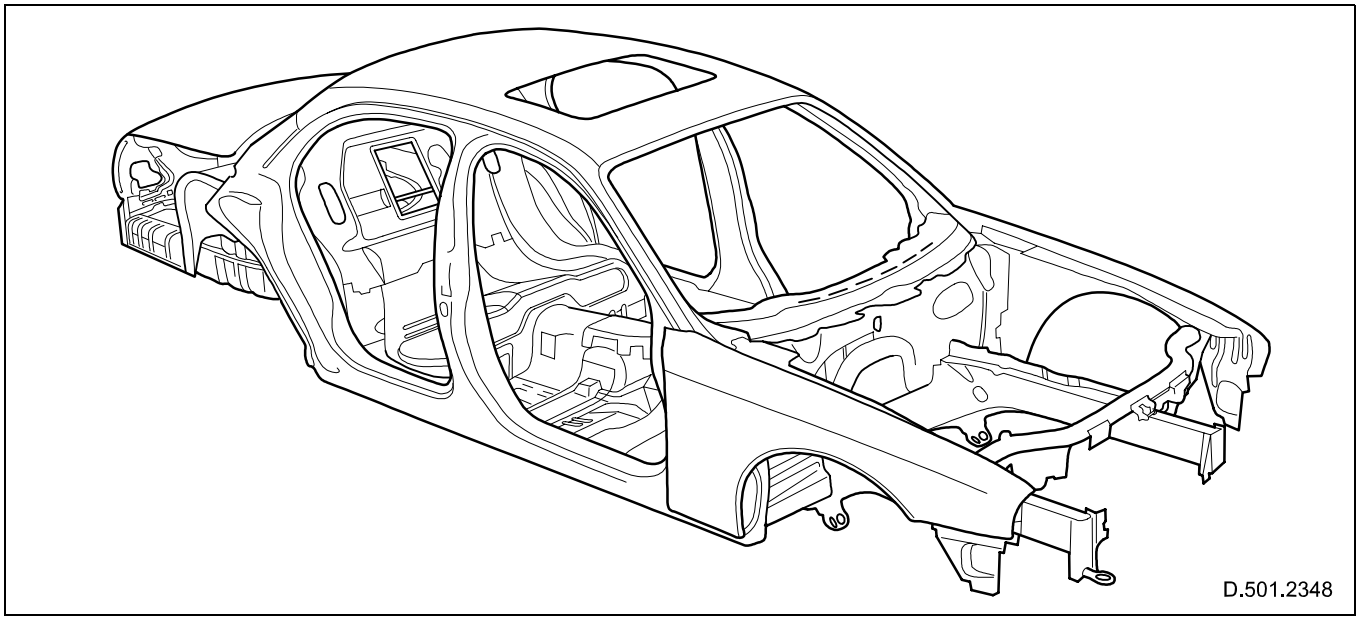


Fig. 135 Body shell

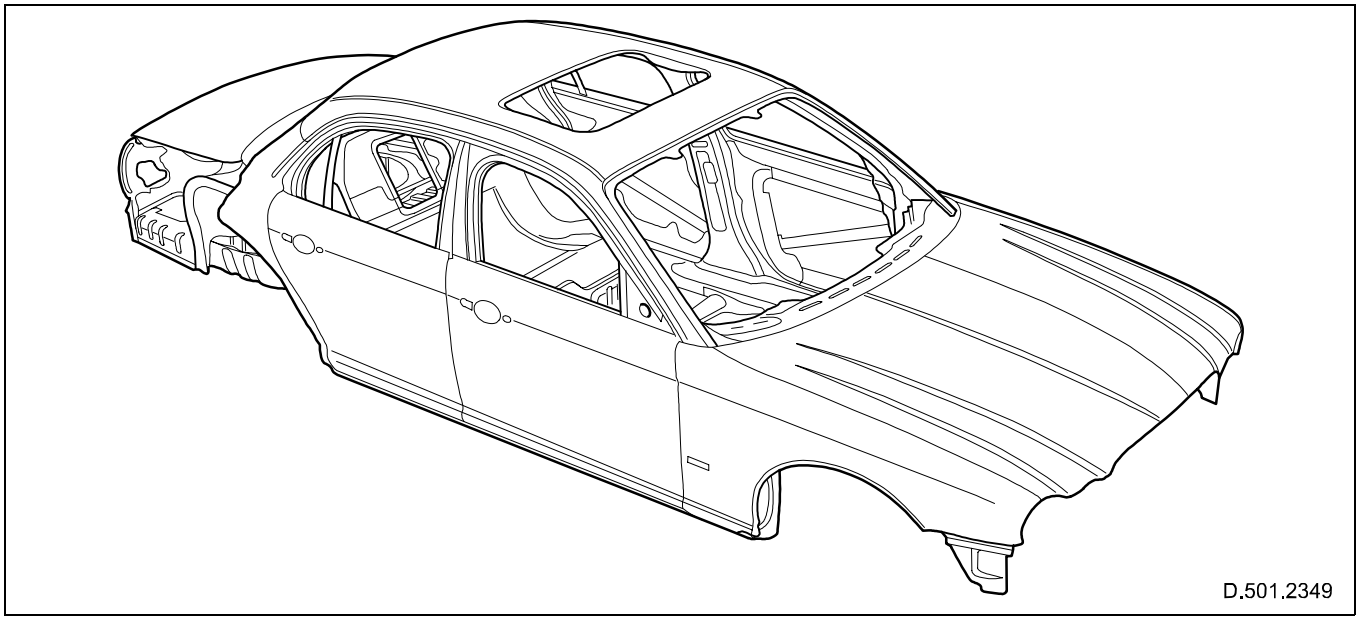


Fig. 136 Body shell with closures

Body Repair Technology

Repairs to aluminum requires different tools and techniques to those used for steel. Repairs should only be undertaken by trained Body and Paint Repair technicians; refer to **New XJ Range Body and Paint Repair Supplement** for detailed information.

Aluminum

Background Facts

- The most abundant metallic element and the third most abundant element in the Earth's crust (only oxygen and silicon are present in larger quantities).
- Discovered and named in 1808 by British scientist, Sir Humphry Davy.
- First isolated as a metal by Danish scientist, Hans Christian Oersted in 1925.
- Naturally exists in very stable combinations with other materials and is therefore not readily accessible.
- Most commonly produced from bauxite ore using the Bayer Process which refines the ore into alumina (aluminum oxide). The final part of the process produces primary aluminum using electrolysis (Hall-Heroult Process).
- More aluminum is now produced than the combined total of all other non-ferrous metals.

Alloying Elements

Aluminum is not used in its purest form, it is alloyed with other elements to enhance its properties. Selected quantities of certain alloys (copper, manganese, silicon, magnesium, zinc, lithium and others) are added to produce the required physical properties or characteristics.

Products

There are three broad classes of aluminum products:

- Ingots
  - cast from furnaces and the source material from which both wrought products and castings are manufactured.
- Wrought products
  - extrusions, tube, rod, plate and foil are mechanically deformed during production to suit defined uses.
- Castings
  - allows the production of shapes in which mechanical properties are determined by alloying elements and thermal treatments after casting.

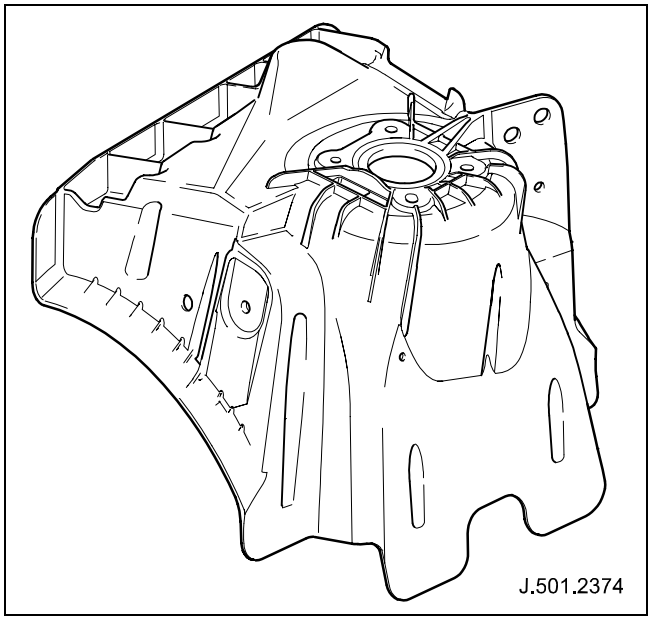


Fig. 137 Typical casting (448 alloy)

The aluminum industry uses a standardized numbering system to distinguish one alloy from another: wrought alloys are designated a four-digit number; cast alloys are designated a three-digit number. The first digit is used to represent the principal alloy, for example: 5 for magnesium; 6 for magnesium and silicon.

Properties and Characteristics

- Silver/grey in appearance.
- Light - one third of the mass of mild steel.
- Strong - double the strength-to-weight ratio of steel.
- Corrosion resistant; refer to **Corrosion**.
- Good thermal conductor.
- Good electrical conductor.

Corrosion

Under normal environmental conditions, aluminum is protected by an oxide-layer that forms and naturally inhibits the onset of corrosion.

NOTE: Under certain circumstances the oxide-layer can break down and rapid corrosion can result due to the chemically reactive nature of aluminum alloys.

The two principle types of corrosion are crevice and galvanic:

- Crevice corrosion occurs in environments where atmospheric oxygen is excluded and an electrolyte, such as salt water, is present.

NOTE: Such conditions could occur where road debris and mud is allowed to accumulate.

- Galvanic corrosion occurs when aluminum is placed in direct contact with a more noble metal or carbon in the presence of an electrolyte.

NOTE: A moist environment can act as an electrolyte.

CAUTION:

- **Avoid using components that could damage the paint system, such as, self-tapping screws, spring-steel clips or paint-clearing screws.**
- **To ensure anti-corrosion integrity is maintained, use only genuine Jaguar fasteners; refer to JTIS.**
- **Always reinstate the paintwork to its condition prior to commencing the repair; refer to New XJ Range Body and Paint Repair Supplement for detailed information.**

Material Incompatibility

Materials that are incompatible with aluminum include:

- All copper alloys (brasses, aluminum and silicon bronzes, cupro-nickels and gun metals such as phosphor and tin bronzes).

NOTE: Copper and its alloys should not be used unless suitably coated or isolated.

- Noble metals such as gold, silver and its alloys (including some hard solders), platinum and rhodium. These metals should not be placed in contact with aluminum even with an intervening paint layer.

NOTE: A noble metal is defined as one that resists chemical action, does not corrode or tarnish in air or water, and is not easily attacked by acids.

Materials containing carbon black should not be used, examples include certain rubber compounds and some black (paint) finishes. Similarly, plastics and composites containing carbon (graphite) fibers should not be used in direct contact with aluminum.

Material Compatibility

Materials that are generally compatible with aluminum include: all plastics, magnesium, zinc and suitably protected steel.

NOTE: Suitable protection for steel includes organic finishes such as electrocoat and powder coat. Sacrificial coatings such as passivated zinc, zinc alloy platings and proprietary 'organic' finishes are all generally suitable.

Stainless steel is generally compatible with aluminum although under certain conditions the protective oxide films on both metals could break down resulting in rapid galvanic corrosion. Anodically protected steel such as zinc coating is generally preferable.

Benefits

The high-strength and low-weight characteristics of aluminum, potentially lead to benefits in the following areas:

Weight

Vehicle sizes can be maintained while reducing overall weight.

Fuel

The reduction in weight leads to improved fuel economy and therefore reduced vehicle exhaust emissions.

Recycling

Recycling is readily achieved and provides significant environmental benefits. Recycling requires far less energy and produces far less emissions when compared with the primary production of aluminum.

Jaguar Usage

- Outer-surface panels including closures, roof and fenders are manufactured from 6111 alloy, which gains its property of high dent resistance whilst going through the electrocoating and paint-bake cycles.
- The chassis and support structure is constructed using various gauges of 5754 alloy. 5754 has a low magnesium content (less than a nominal 3%) which produces a combination of long-term stability, good formability and strength to provide good crash performance.
- Cast elements of the body allow strong, accurate, lightweight construction for areas like the suspension mounting points but are not considered repairable.
- High strength and rigid joints are achieved using a combination of adhesive and self-piercing rivets.

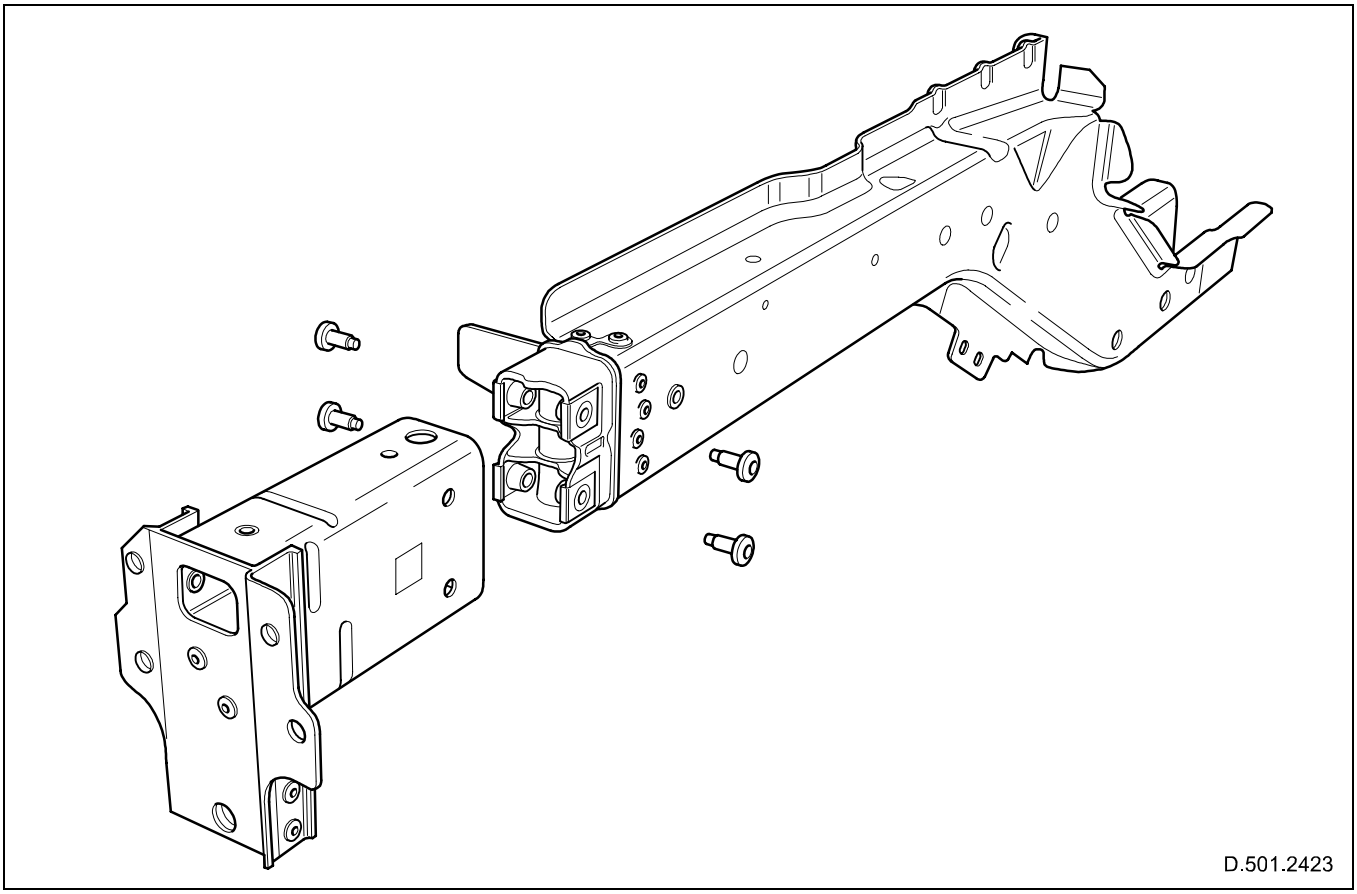


Fig. 138 Bolt-on crush-can

Secondary Bulkhead

A secondary bulkhead, which is attached to the main bulkhead, has been introduced to reduce noise and eliminate fume ingress into the passenger compartment.

NOTE: To simplify access for service, two panels on the driver's side of the secondary bulkhead are removable; refer to **JTIS**.

The pollen-filter intake-bucket, located on the passenger side of all vehicles, performs a similar function to the secondary bulkhead. The bucket has improved water-management capabilities, to minimize moisture around the engine control module (ECM) connector, which is located directly underneath.

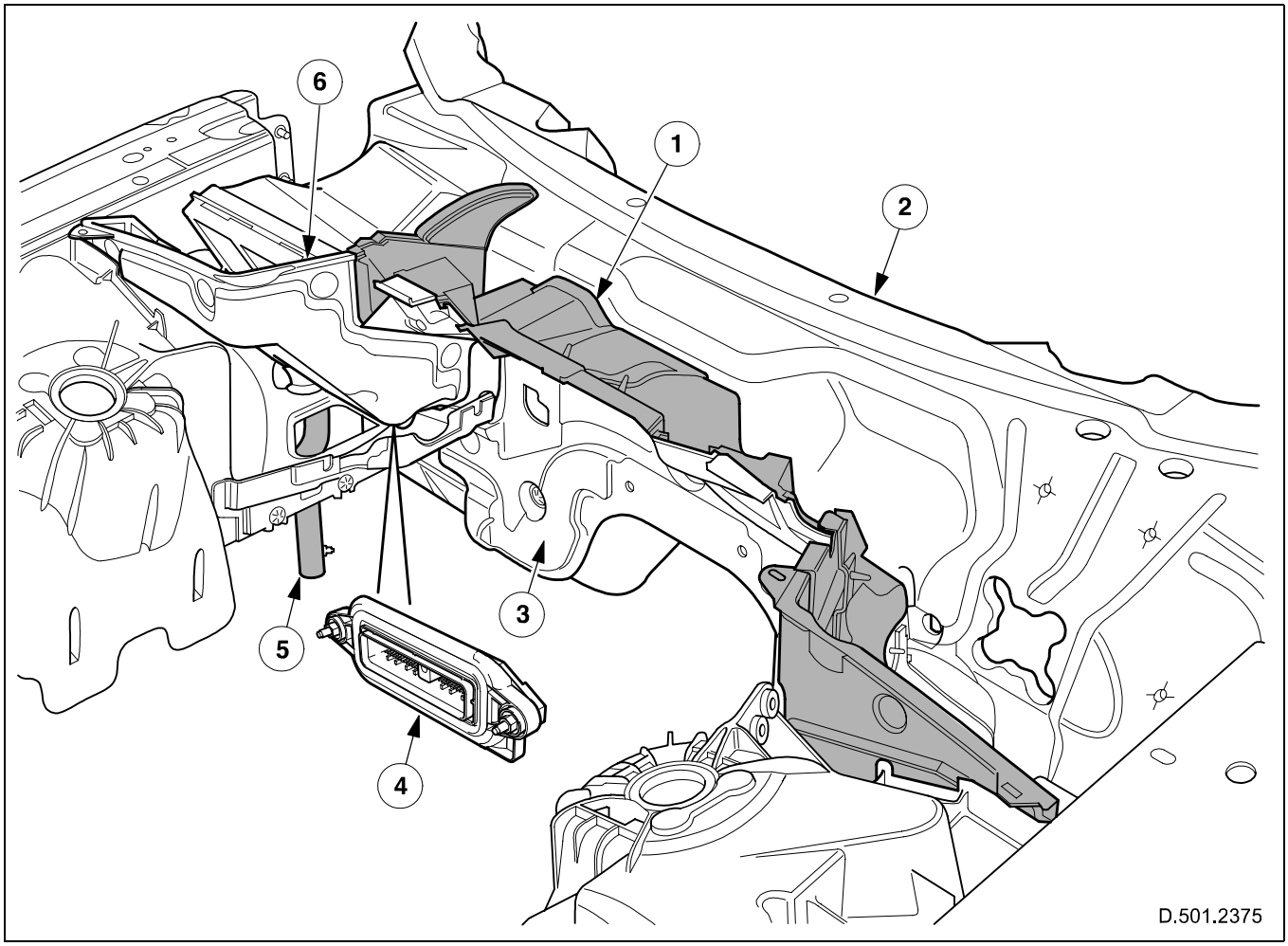


Fig. 139 Secondary bulkhead location

1. Secondary bulkhead
2. Bulkhead
3. Sound proofing
4. ECM electrical connector
5. Drain tube
6. Air intake bucket

Seats

Front Seats

WARNING: Prior to seat removal and before disconnecting the seat harness (which includes air bag connectors), the vehicle battery should be disconnected and a period of at least one minute allowed to elapse. The same amount of care should be taken when handling and storing these seats, as would be taken when handling and storing vehicle air bags in isolation.

NOTE: Refer to **JTIS** for detailed Removal and Installation instructions.

All front seats are fitted with the following features as standard:

- Integral side air bags; refer to **Occupant Safety, Air Bag Modules**.
- Head restraints.
- Safety belt buckle/pretensioner; refer to **Occupant Safety, Safety Belts**.
- Anti-whiplash mechanism; refer to **Occupant Safety, Anti-whiplash System**.

The driver and passenger seats, although almost identical, have some unique components fitted: the driver's seat has a seat track position sensor and the passenger's seat has an occupant weight-sensing system. In both instances the components form an integral part of the occupant safety system; refer to **Occupant Safety, Occupancy and Position Sensing**.

NOTE: Individual components of the passenger seat weight-sensing system, which includes the seat cushion assembly, are not serviceable and must be replaced as a complete unit; refer to **JTIS**.

Driver Seat

Depending on specification, the vehicle may be installed with heated cushions and backrest. In addition to the standard electrical seat functionality, the following features may also be adjusted electrically:

- Head restraint.
- Extendible seat cushion.
- Lumbar support.

Driver seat module

The driver seat module (DSM) is located under the driver seat. In addition to supporting standard seat functionality the module also supports the electrically-adjustable head restraint and extendible seat-cushion; refer to **New XJ Range Electrical Guide** for detailed connection information.

Up to three personality configurations in relation to seat positions, are possible using the seat memory switch. The positions are stored and retrieved from the driver door module (DDM).

NOTE: Lumbar positions cannot be saved using the memory feature.

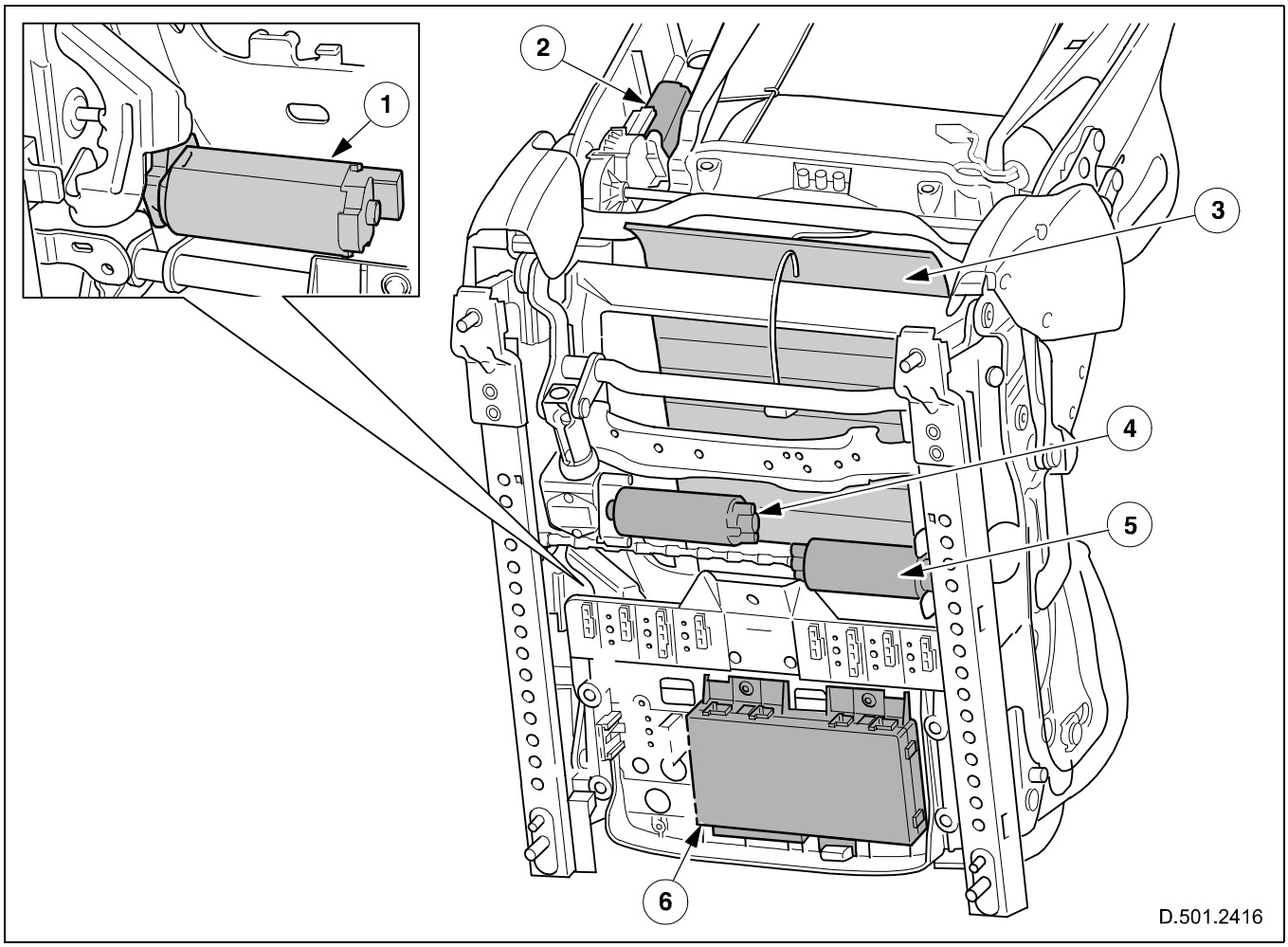


Fig. 140 Driver power-seat - component locations

1. Rake adjustment motor (front)
2. Recline adjustment motor
3. Seat cushion heater
4. Height-adjustment motor
5. Fore/aft adjustment motor
6. Driver seat module

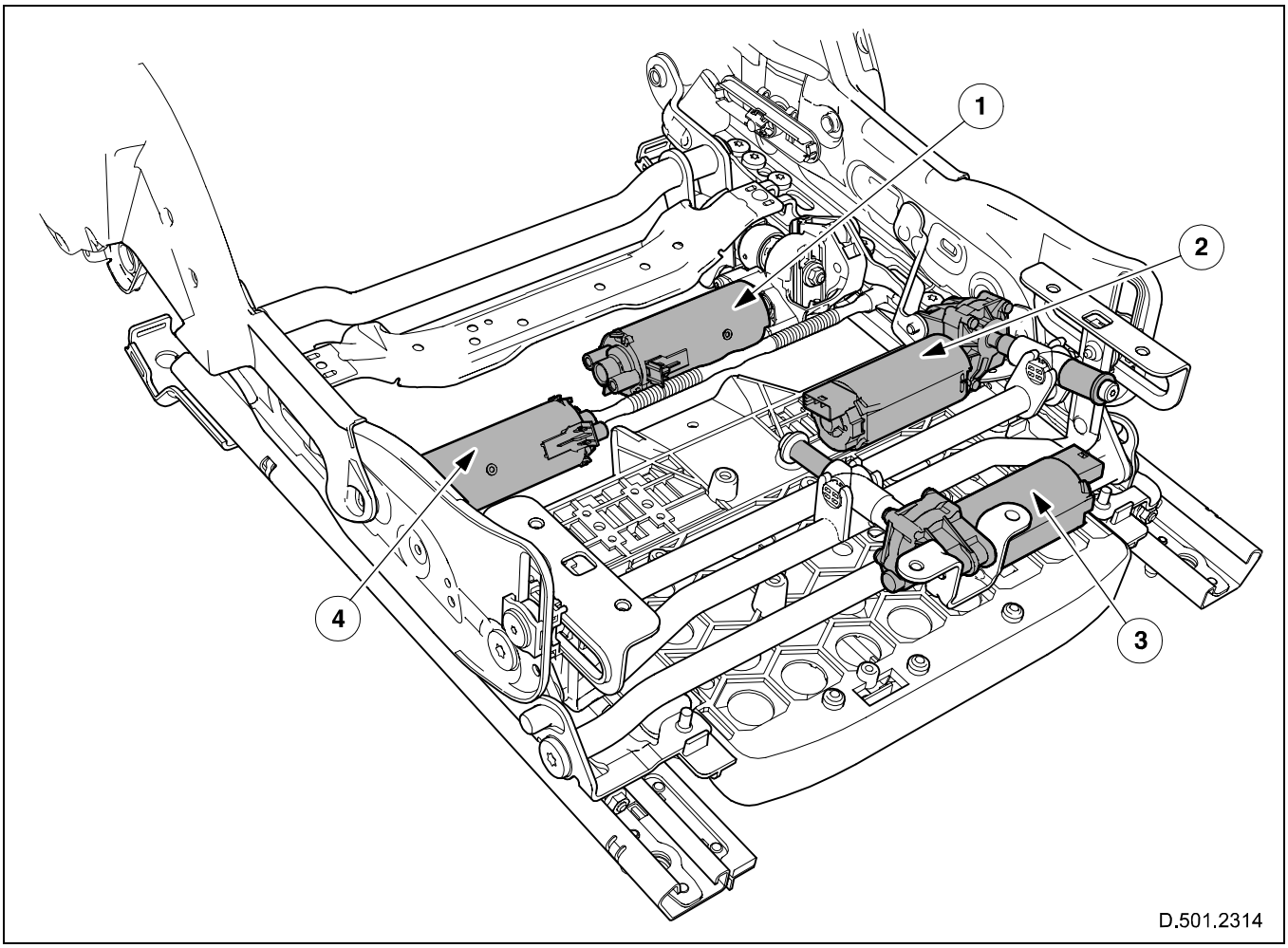


Fig. 141 Power seat with extendible cushion

1. Height-adjustment motor
2. Rake adjustment motor (front)
3. Cushion-extend motor
4. Fore/aft adjustment motor

Passenger Seat

The switches for electrically adjusting the passenger seat are wired directly to the appropriate motor; refer to **New XJ Range Electrical Guide** for detailed electrical connection information.

NOTE: Rear seats with electrical functionality, have a switch installed (where specified) that will allow adjustment of the front passenger seat, recline and fore/aft positions, by the rear occupant seated directly behind.

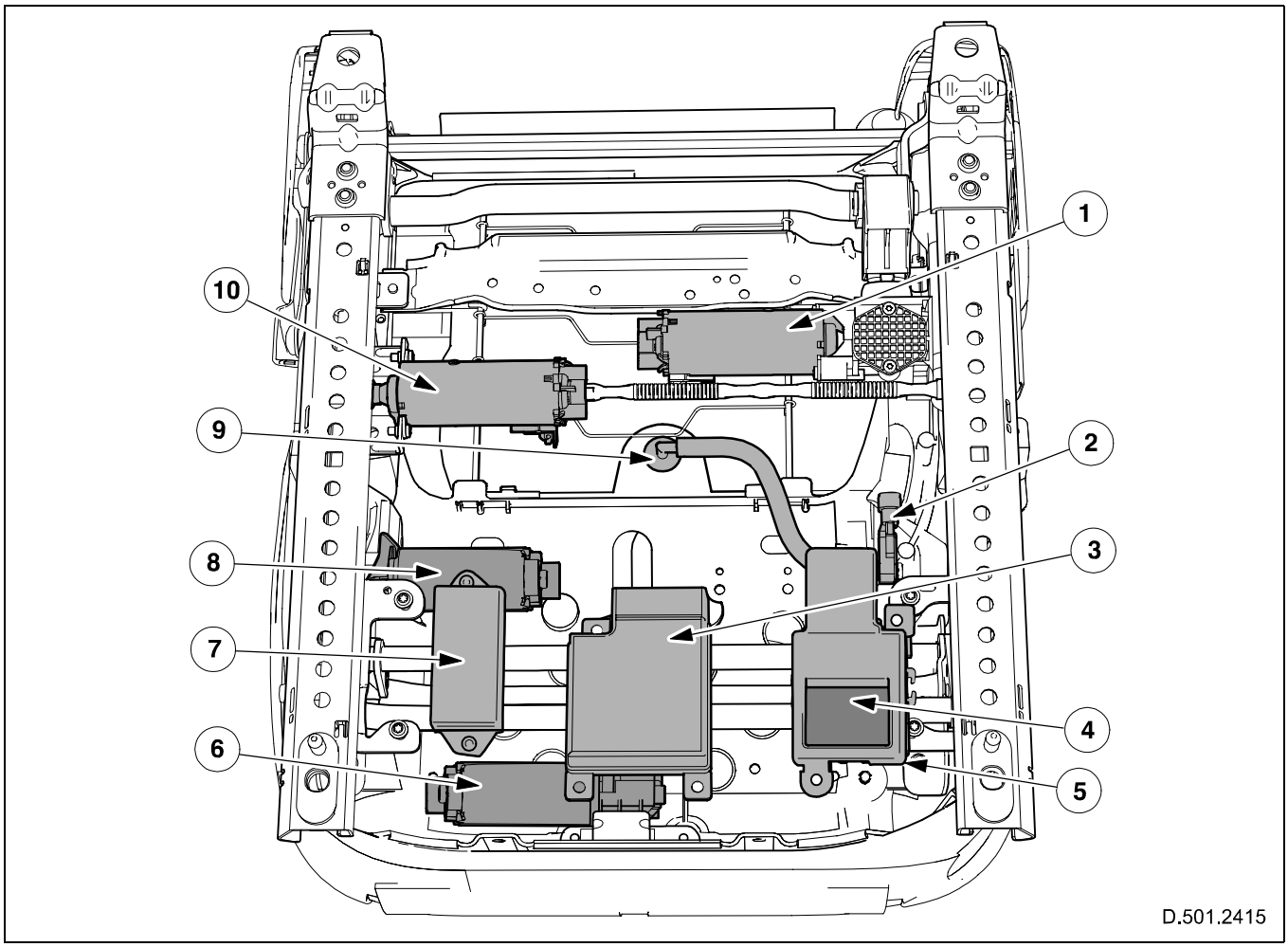


Fig. 142 Passenger power-seat - component locations (mounting tray removed)

1. Height-adjustment motor
2. Pressure sensor
3. Occupancy sensing module
4. Seat weight-sensing module
5. Seat weight-sensing module cover
6. Cushion-extend motor
7. Passenger rear-adjust relay module
8. Rake adjustment motor (front)
9. Silicon bladder connector and pipe
10. Fore/aft adjustment motor

Electrically-Operated Head Restraint

The electrically-operated head restraint (where applicable) is occupant-controlled from the seat-mounted switch. The driver seat module (DSM) responds to the switch position chosen, by providing an output to the respective drive motor; refer to **New XJ Range Electrical Guide** for detailed connection information.

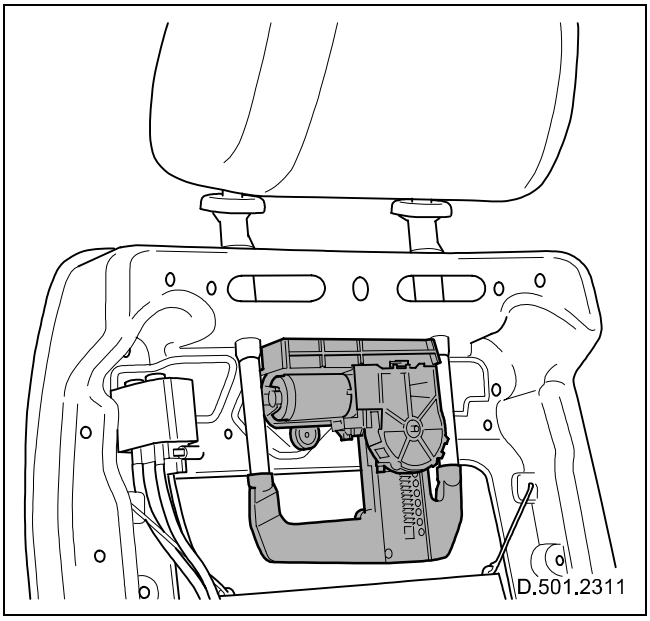


Fig. 143 Electrically operated head restraint

Power Lumbar

The 4-position power lumbar (where installed) comprises a single motor-driven pump, which inflates or deflates air cells as required to provide upper and lower lumbar support. The degree of support is determined by the operation of the seat-mounted switch. Depending on the switch-direction chosen, one of four solenoids housed within the solenoid pack is connected to the pump, which provides lumbar support by adjusting the amount of air in the appropriate cell. Vehicles fitted with the basic power-lumbar, utilize the lower air-cell only; refer to **New XJ Range Electrical Guide** for detailed connection information.

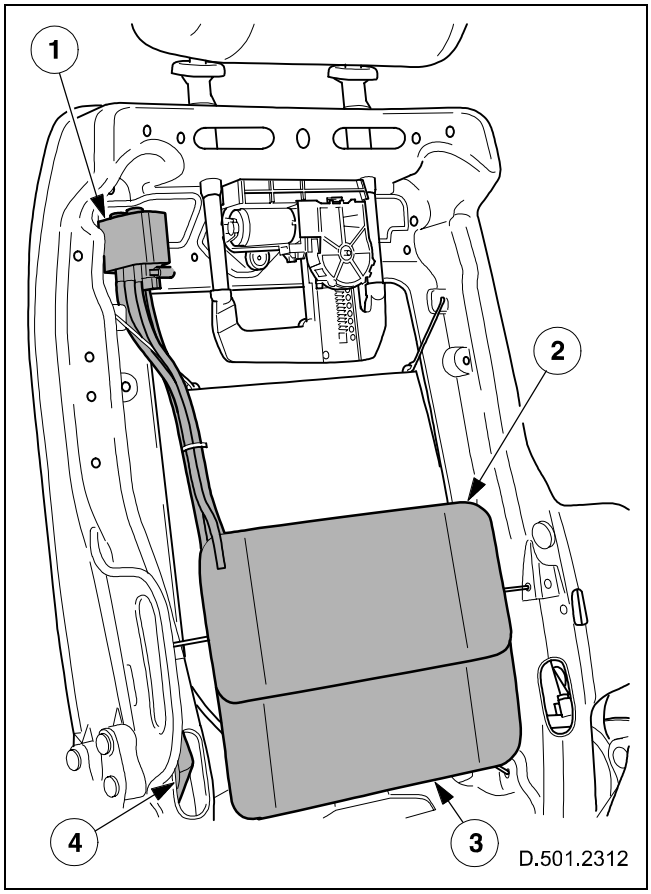


Fig. 144 Power lumbar

1. Solenoid pack
2. Upper air-cell
3. Lower air-cell
4. Motor-driven pump

Heated Seats

The heated seat system which offers a choice of three settings, comprises:

- Heated seat switches.
- Heated seat status LEDs.
- Backrest heater element.
- Cushion heater element and thermostat.
- Front electronic module.

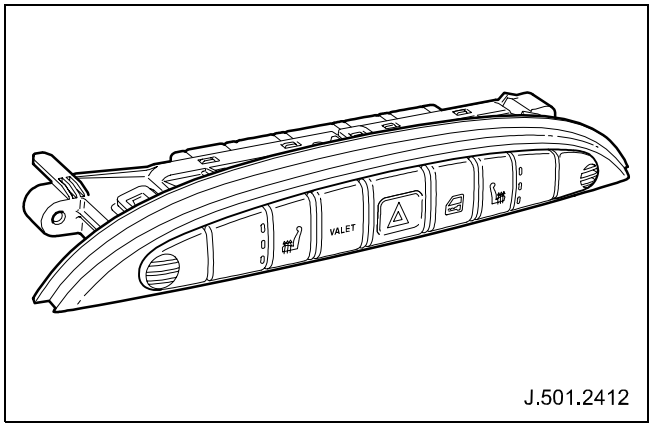


Fig. 145 Heated seat switches

As one of its many functions, the front electronic module (FEM) controls the seat heating feature by providing the appropriate response depending on the status of the heated seat switches; refer to **New XJ Range Electrical Guide** for detailed connection information.

Heater functionality is constantly monitored by the electrical load management system (ELMS); refer to **Electrical Load Management System**. The ELMS dictates that in circumstances where the generated electrical power is less than the electrical consumption, selected systems may be inhibited or operated using reduced power for as long as is necessary.

NOTE: Tell-tale LEDs remain illuminated so that any corrective action is not apparent to the driver.

The heated seat function (when selected) permits the electrical heating of the backrest and cushion. The heating system for each seat is activated by separate switches. The switches complete with status LEDs are located in the center console switch assembly.

NOTE: Where applicable, the heated steering wheel function is automatically activated concurrent with the driver's heated seat switch; refer to **Heated Steering Wheel**.

Provided the engine is 'running', pressing a heated seat switch, will select the maximum heat setting for the chosen seat, as confirmed by three illuminated red LEDs. A second press selects the mid-setting (two LEDs) and a third press selects the lowest heat setting (one LED). A fourth press deactivates the seat heater.

Once the heated seat function has been activated, it will persist until one of the following conditions have been satisfied:

- The function is deactivated by pressing the switch for a fourth time.
- The ignition key is turned to position 'I'.
- A malfunction is detected by the front electronic module (FEM).

NOTE: The seat heaters are designed to operate at temperatures below a predetermined limit and therefore operation may be inhibited due to: storing the vehicle in a heated garage, body heat or warm ambient temperatures.

Rear Seats

Depending on market and vehicle specification, the rear seats will be one of the following:

- Fixed bench style with armrest.
- Electrically-adjustable, twin-back and bench cushion style (complete with armrest).
- Electrically-adjustable twin seats.

NOTE: Vehicles fitted with twin seats have a Rear Floor Console installed; refer to **Rear Floor Console**.

Depending on vehicle specification, heaters may be integral to the cushions and backrest; refer to **Rear Heated Seats**.

The following features are electrically adjustable (where applicable):

- Head restraint.
- Lumbar support.
- Backrest.

Electrically-Adjustable Backrest

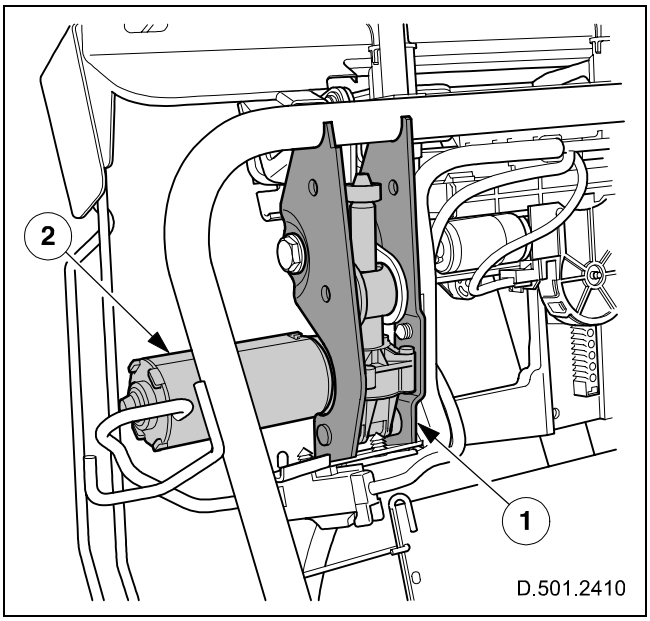


Fig. 146 Electrically-adjustable backrest

1. Backrest recline mechanism
2. Backrest recline adjustment motor

The electrically-adjustable backrest (where applicable) is occupant-controlled from the seat-mounted switch. The rear memory module (RMM) responds to the switch position chosen, by providing an output to the drive motor; refer to **New XJ Range Electrical Guide** for detailed connection information.

Electrically-Adjustable Head Restraint

The electrically-adjustable head restraint (where applicable) is occupant-controlled from the seat-mounted switch. The rear memory module (RMM) responds to the switch position chosen, by providing an output to the drive motor; refer to **New XJ Range Electrical Guide** for detailed connection information.

Power Lumbar

The 4-position power lumbar (where installed) comprises a single motor-driven pump, which inflates or deflates air cells as required to provide upper and lower lumbar support. The degree of support is determined by the operation of the seat-mounted switch. Depending on the switch-direction chosen, one of four solenoids housed within the solenoid pack is connected to the pump, which provides lumbar support by adjusting the amount of air in the appropriate cell; refer to **New XJ Range Electrical Guide** for detailed connection information.

Front Passenger Seat Adjustment

Depending on vehicle specification, the rear seats may have switch installed that will allow adjustment of the front passenger seat, recline and fore/aft positions, by the rear occupant seated directly behind. The relevant front passenger seat motors are activated by the passenger rear-adjust relay module (item 7, **Fig. 142**) in response to the switch position selected; refer to **New XJ Range Electrical Guide** for detailed connection information.

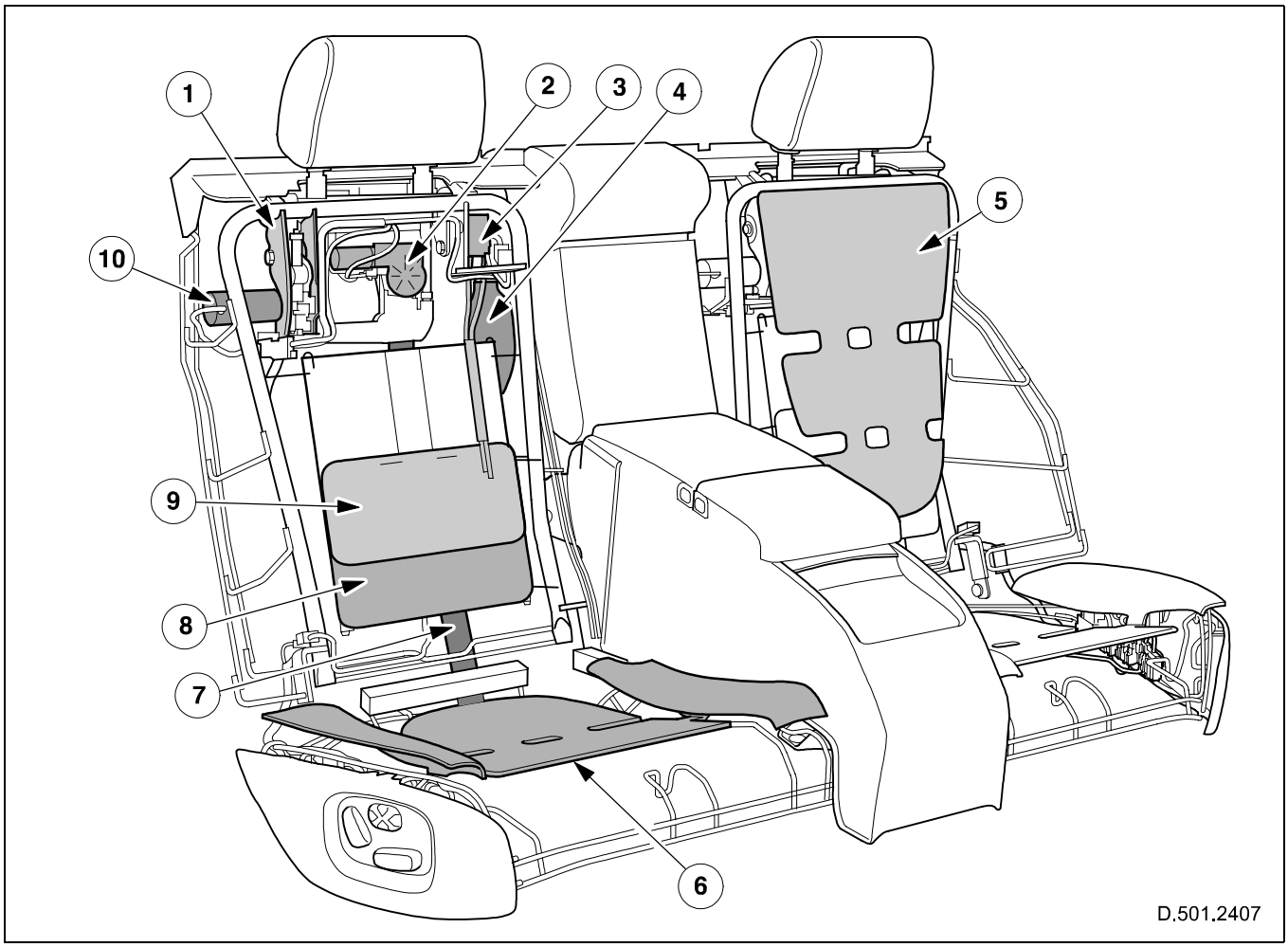


Fig. 147 Electrically-adjustable twin rear seats

1. Backrest recline mechanism
2. Head restraint mechanism
3. Lumbar solenoid pack
4. Motor-driven lumbar pump
5. Heater (backrest)
6. Heater (cushion)
7. Release strap
8. Lower air-cell
9. Upper air-cell
10. Backrest recline adjustment motor

NOTE: For clarity, the right-hand seat position is illustrated with the backrest heater removed.

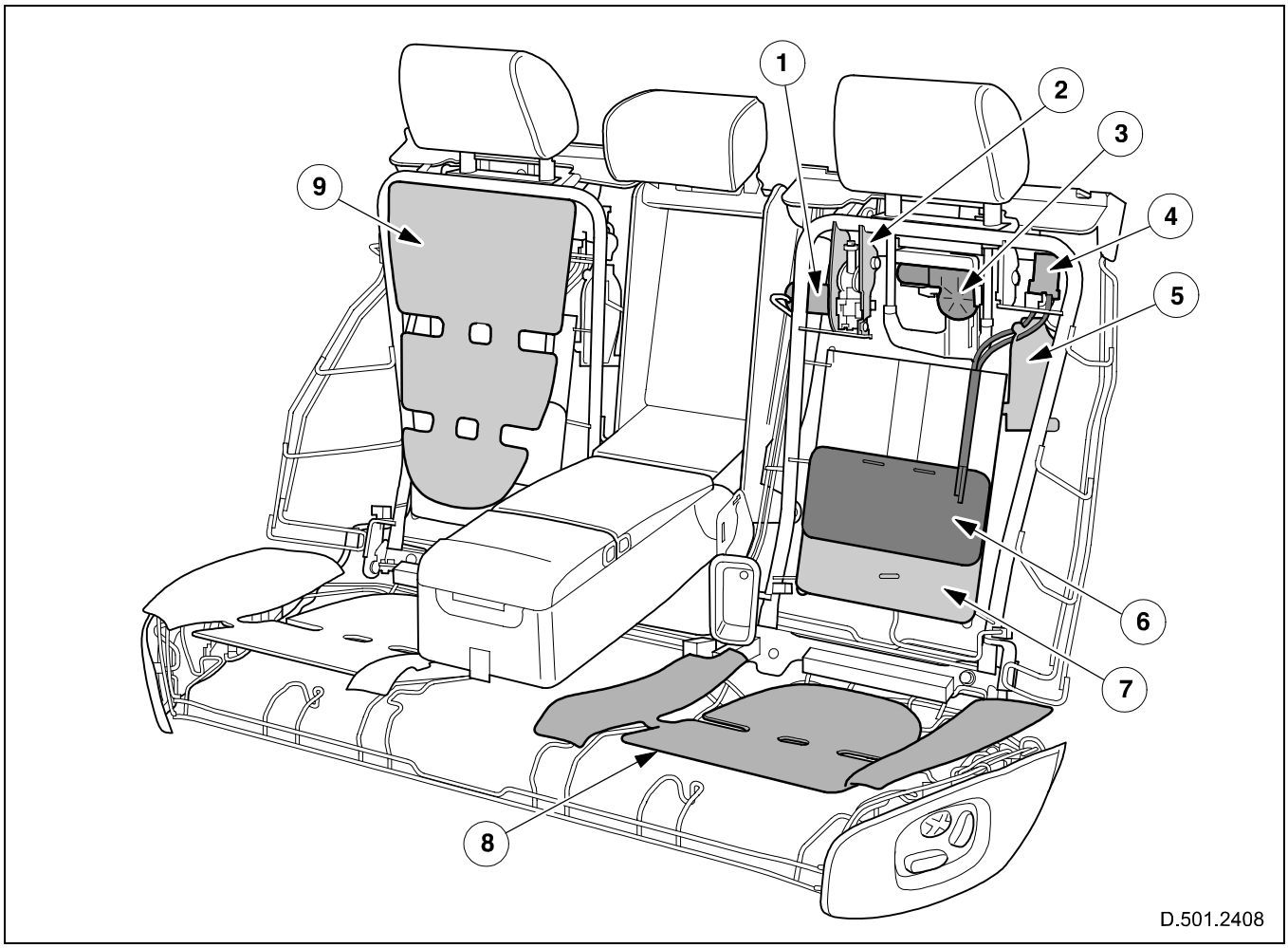


Fig. 148 Electrically-adjustable rear bench seat with armrest

1. Recline adjustment motor
2. Recline mechanism
3. Head restraint mechanism
4. Lumbar solenoid pack
5. Motor-driven lumbar pump
6. Upper air-cell
7. Lower air-cell
8. Heater (cushion)
9. Heater (backrest)

NOTE: For clarity, the left-hand seat position is illustrated with the backrest heater removed.

Backrest Release Mechanism

Access for service purposes is achieved by unlatching the backrest using the release strap, which is accessible once the seat cushion has been removed.

CAUTION: Make sure the backrest is in its most rearward position before removal; refer to JTIS for detailed Removal and Installation instructions.

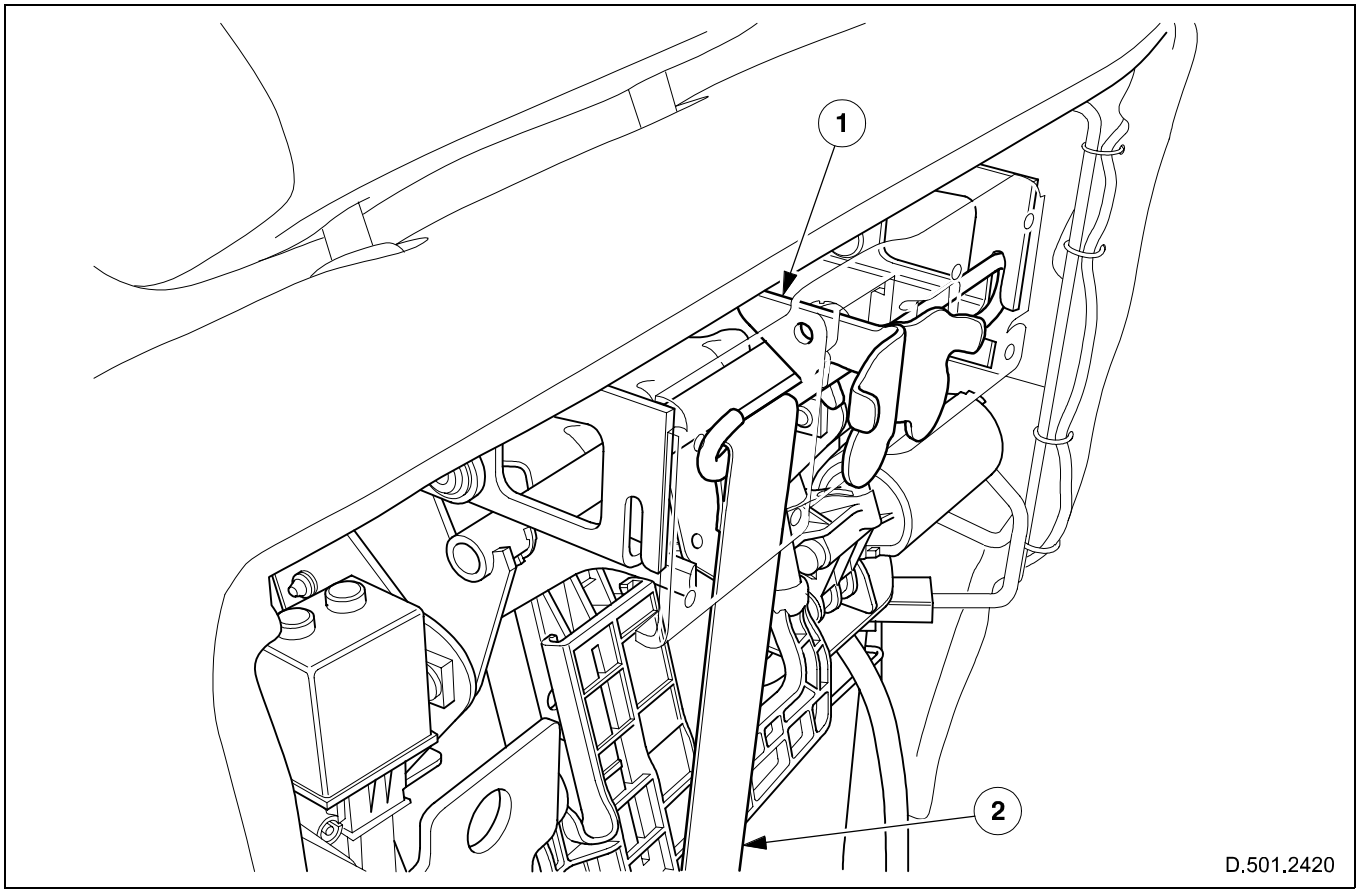


Fig. 149 Backrest release mechanism

1. Latch (secured to body panel)
2. Release strap

Rear memory module

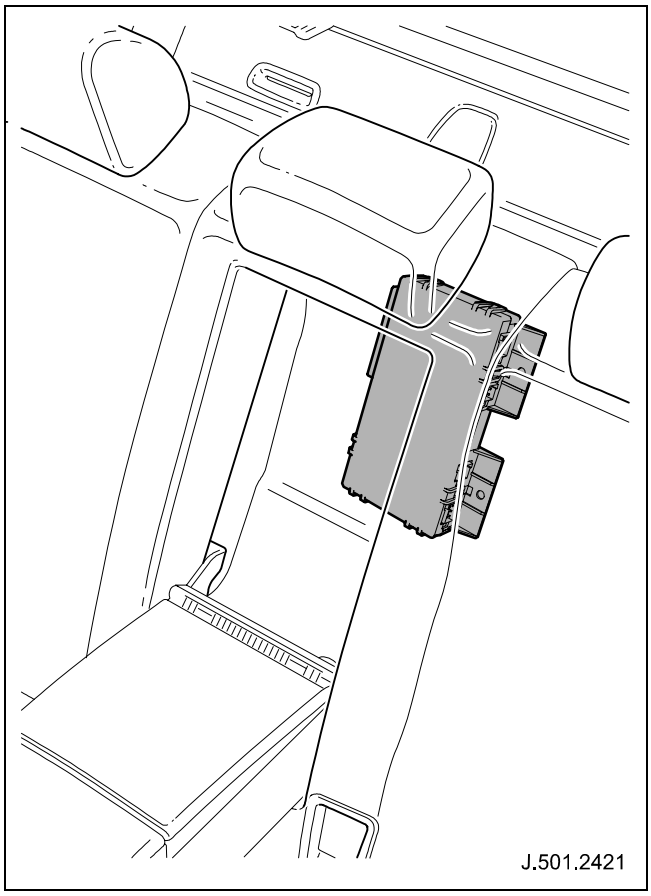


Fig. 150 Rear memory module

The rear memory module (RMM) is attached to the body-in-white behind the seat or to the ski-hatch blanking plate if the Rear Multimedia System is installed.

The RMM interfaces with the seat memory switches and the seat-mounted switchpack to control the rear seat electrical functionality. In response to selections made by the rear seat occupants, output signals are sent to the motors that control the:

- rake of the backrest;
- head restraint.

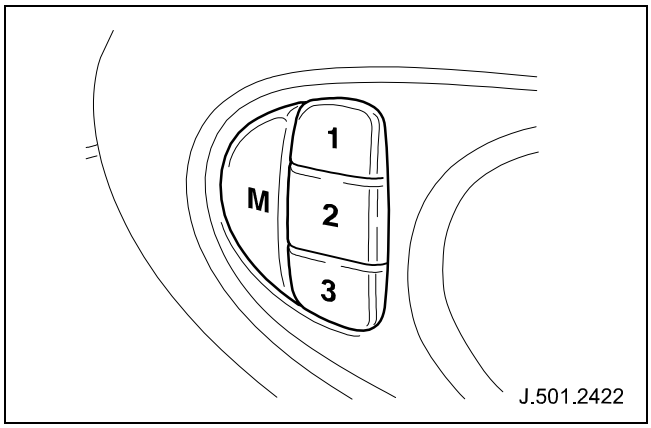


Fig. 151 Memory switch

Up to three personality configurations in relation to seat positions, are possible using the seat memory switch. The positions are stored and retrieved from the rear memory module (RMM).

NOTE: Lumbar positions cannot be saved using the memory feature.

Refer to **New XJ Range Electrical Guide** for detailed connection information.

Rear Heated Seats

Where applicable, the heated seat system comprises:

- Heated seat switches.
- Backrest heater element.
- Cushion (inner and outer) heater element and thermostat.
- Rear electronic module (REM).

As one of its many functions, the rear electronic module (REM) controls the seat heating feature by providing the appropriate response depending on the status of the heated seat switches; refer to **New XJ Range Electrical Guide** for detailed connection information.

The heated seats is one of the areas monitored by the electrical load management system (ELMS); refer to **Electrical Load Management System**. The ELMS dictates that in circumstances where the generated electrical power is less than the electrical consumption, selected systems may be inhibited or operated using reduced power for as long as is necessary.

NOTE: The tell-tale LED will remain illuminated so that the action is not apparent to the driver.

The heated seat function (when selected) permits the electrical heating of the backrest and cushion. The heating system for each seat is activated by separate switches, located in the floor console.

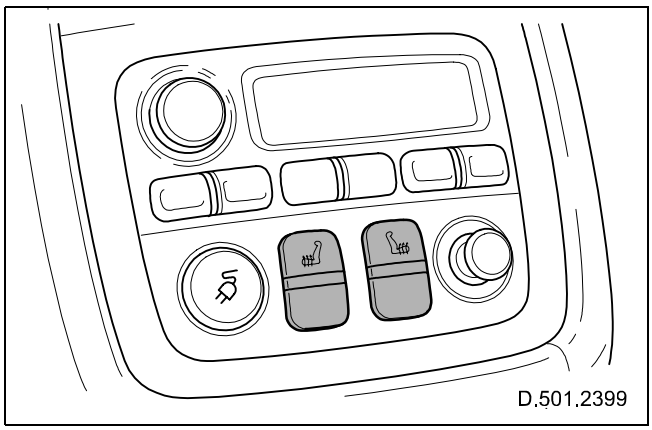


Fig. 152 Heated seat switches (4–zone console)

Provided the engine is 'running', pressing a heated seat switch, will select the maximum heat setting for the chosen seat, as confirmed by three illuminated red LEDs. A second press selects the mid-setting (two LEDs) and a third press selects the lowest heat setting (one LED). A fourth press deactivates the seat heater.

Once the heated seat function has been activated, it will persist until one of the following conditions have been satisfied:

- The function is deactivated by pressing the switch for a fourth time.
- The ignition key is turned to position 'I'.
- A malfunction is detected by the REM.

NOTE: The seat heaters are designed to operate at temperatures below a predetermined limit and therefore operation may be inhibited due to: storing the vehicle in a heated garage, body heat or warm ambient temperatures.

Armrest

The fold-down armrest has integral cup holders and depending on market and vehicle specification may also be fitted with passenger entertainment control panel; refer to **Passenger Entertainment Control Panel**.

NOTE: The cellular phone is a dealer installed option for certain markets; refer to **Cellular Phone**.

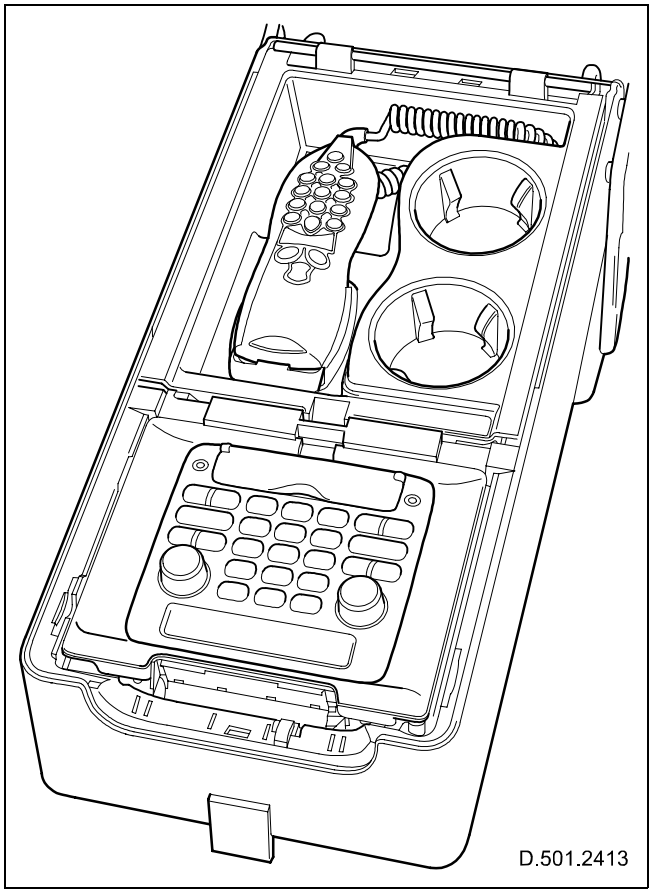


Fig. 153 Armrest (without covers)

Instrument Panel And Consoles

Instrument Panel

The instrument panel is built around a magnesium cross-car beam. The magnesium casting provides benefits in terms of both weight and accuracy of alignment.

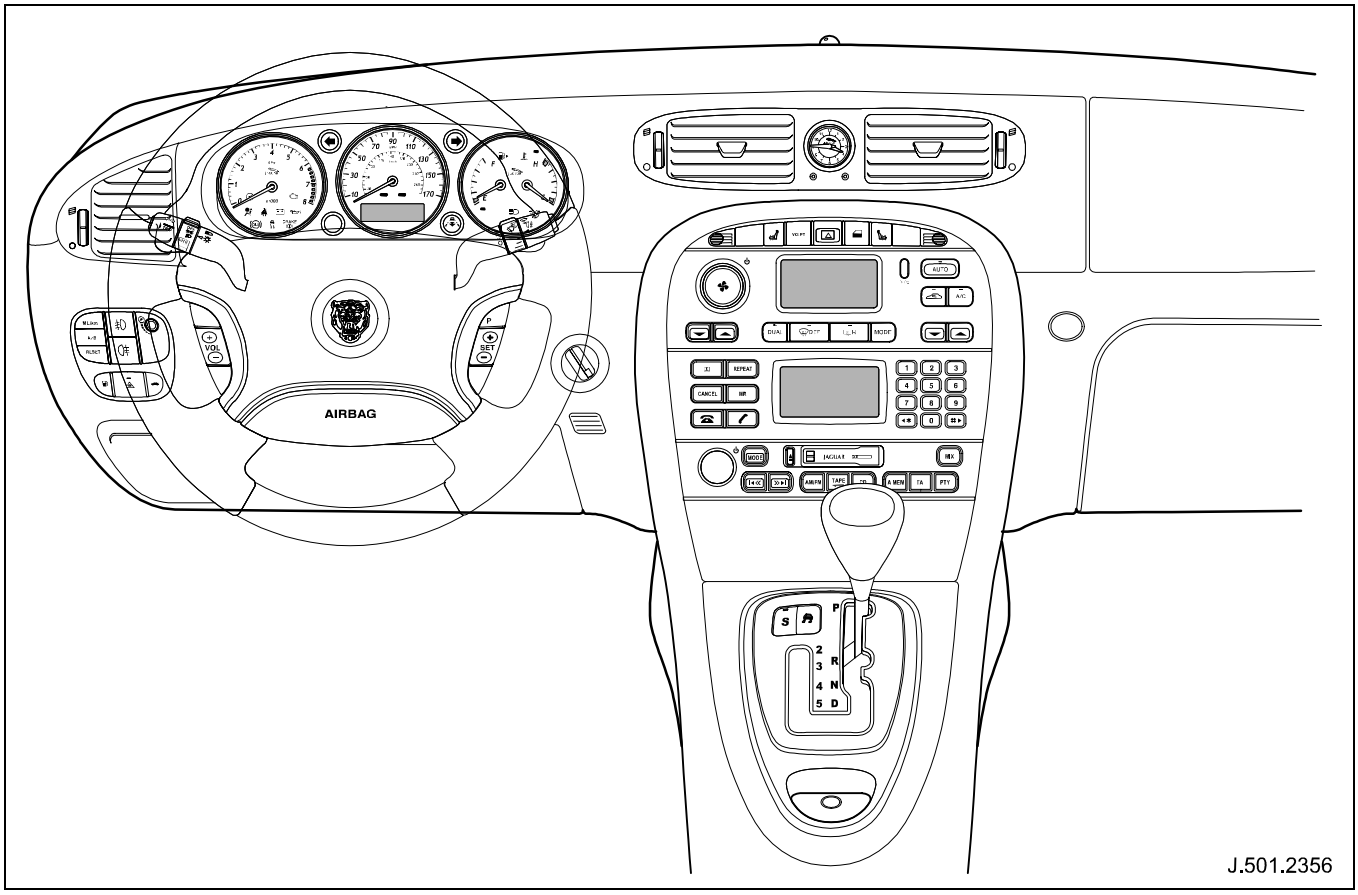


Fig. 154 Instrument panel

The following components are fitted to, or installed within the instrument panel:

- instrument cluster;
- passenger air bag module;
- glove compartment;
- air distribution registers;
- air distribution ducting;
- auxiliary lighting switch;
- in-vehicle temperature sensor;
- sunload/autolamp sensor;
- ignition switch;
- driver's stowage compartment;
- driver's knee-bolster;
- hood release-lever;
- driver's switch assembly (fuel filler-flap / forward alert switch / luggage compartment lid release);
- glove compartment release switch.
- clock

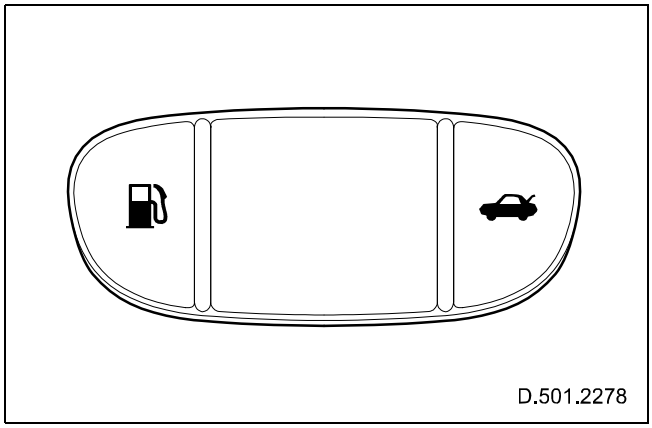


Fig. 155 Fuel filler-flap/luggage compartment lid release

The center console of the instrument panel houses the following:

- center console switch assembly;
- climate control panel or telematics display module; refer to **Climate Control System**;
- audio unit; refer to **In-vehicle Entertainment Systems**.

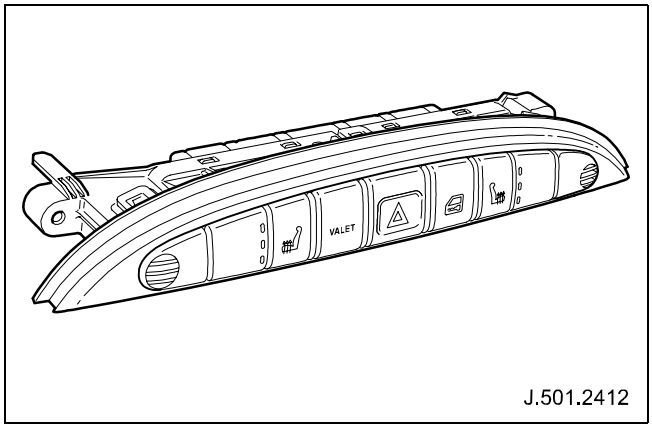


Fig. 156 Center console switch assembly

Depending on vehicle specification, the center console switch assembly comprises:

- heated-seat switches;
- master lock switch;
- hazard warning switch;
- valet mode switch;
- occupancy sensor (one of four); refer to **Occupancy Sensors**.

NOTE: The sensor is installed adjacent to the passenger side of the assembly. To maintain symmetry, the opposite end of the assembly has only the sensor housing installed.

Glove Compartment

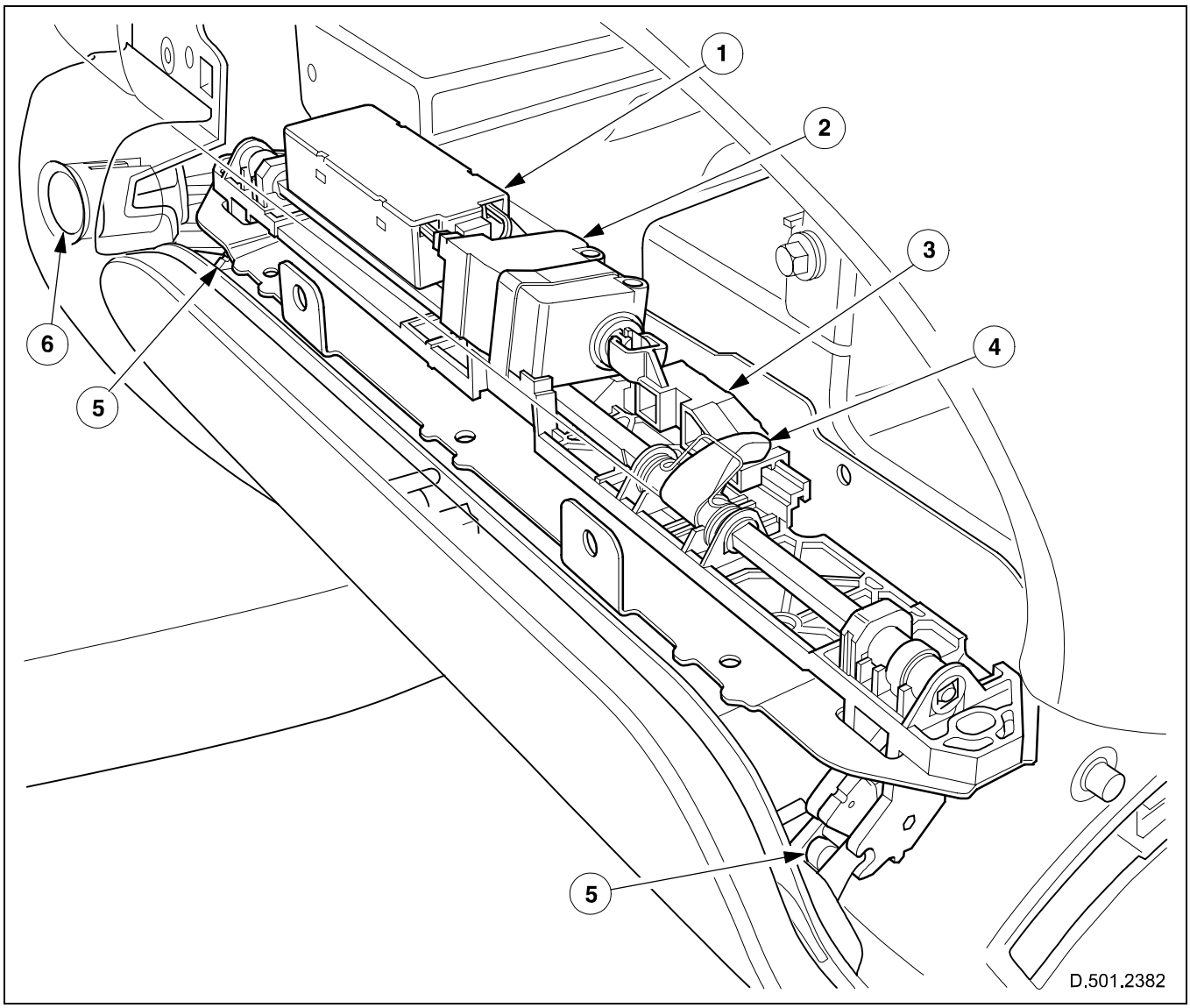


Fig. 157 Glove compartment door release mechanism

1. Control-electronics
2. Motor
3. Actuating slide
4. Release lever
5. Latch
6. Switch

The glove compartment door is electrically secured and can only be released by operating the switch.

NOTE: Should it prove necessary, removal of the end closing panel, from the passenger side of the instrument panel will permit access so that technicians can manually release the mechanism; refer to **JTIS**.

The door is a component part of the anti-theft strategy and therefore cannot be opened when:

- the anti-theft system is actively or passively armed;
- the vehicle is in valet mode;
- the vehicle is centrally or super-locked from the door key-barrel or integrated key transmitter.
- the auto-relocking function has been activated.

NOTE: Access is not inhibited by drive-away door-locking or activation of the master-locking switch or internal door locking/unlocking mechanism.

Providing the mechanism has not been inhibited by a security feature, when the switch is pressed, the front electronic module (FEM) responds by sending a control signal to the motor, via the control-electronics. When activated, the motor causes the actuating-slide to operate the release lever. The lever releases the two latches mounted either side of the door, allowing the door to lower to its fully-open position.

NOTE: If the switch is operated more that 15 times within a 20 second period, the opening function is inhibited. The opening function is reactivated after 20 seconds have elapsed.

An accessory power socket is mounted, outboard, inside the glove compartment.

Floor Console

The 4–zone floor console (where installed) is designed to accommodate the rear climate control system; refer to **Rear Climate Control System**. Actual features vary according to vehicle specification.

NOTE: The j-gate support casting is made from magnesium and secured to the cross-car beam to minimize variation between the instrument cluster and the floor console.

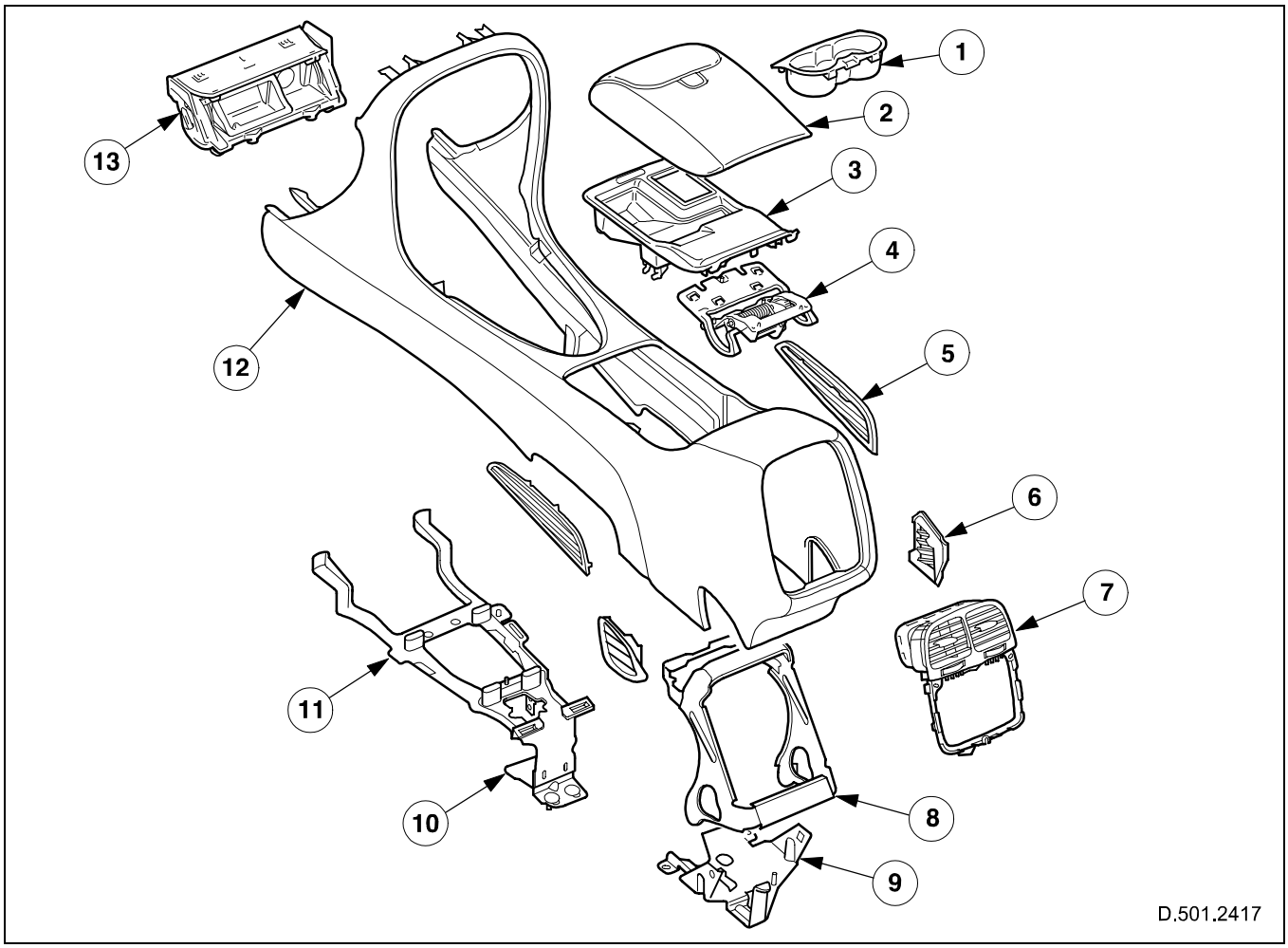


Fig. 158 Floor console assembly (4–zone)

1. Cupholder
2. Armrest
3. Phone (where applicable) stowage area
4. Armrest hinge assembly
5. Climate control input register
6. Climate control floor register
7. Climate control face ducting and registers
8. Console bracket
9. Console to floor mounting bracket
10. Yaw rate sensor bracket
11. J-gate support casting
12. Console
13. Ashtray

The 2–zone floor console, depending upon vehicle specification, consists of the accessory power-socket, ashtray, cigar lighter, heated seat switches and sliding armrest. The center section of the console carries a stowage box complete with a clip-in secondary cup holder. The cellular phone (where installed) is located on the underside of the armrest.

NOTE: The 2–zone floor console is the standard installation and is not designed to accommodate the rear climate control system.

Rear Floor Console

The rear floor console is installed for vehicles fitted with rear twin seats. Depending upon market and vehicle specification, the following features are integral to the console:

- twin cupholders;
- stowage box;
- cellular phone (dealer installation); refer to **Cellular Phone**;
- passenger entertainment control panel; refer to **Passenger Entertainment Control Panel**.

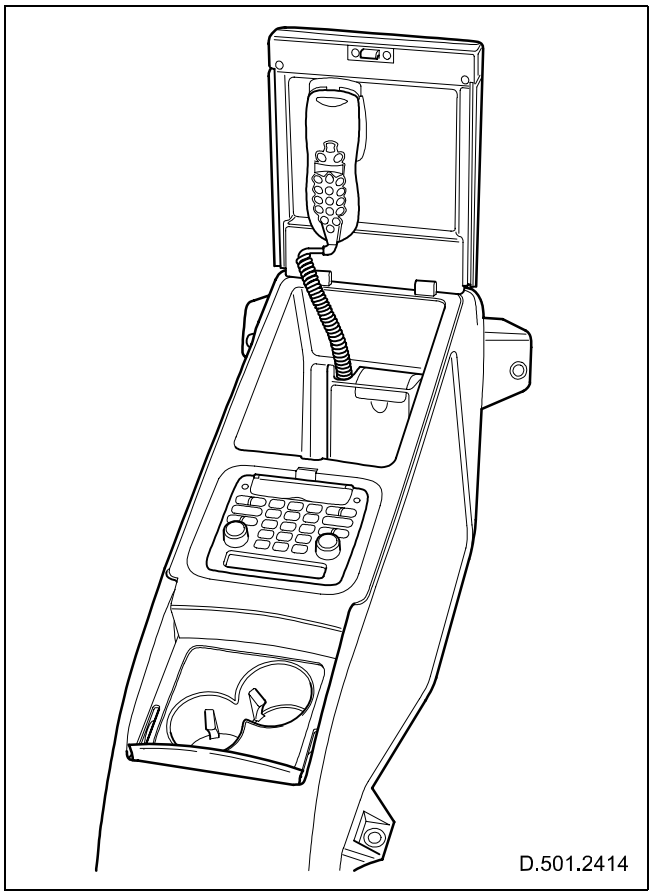


Fig. 159 Rear floor console (with front armrest removed)

Overhead Console

The overhead console, depending on market and vehicle specification, incorporates the following:

- sunblind switch;
- front parking aid deactivation switch;
- courtesy lamp;
- reading/map lamps;
- remote convenience buttons (garage door opener);
- roof opening panel switch;
- microphone;
- intrusion sensors;
- mood lamp.

All switches have backlight illumination and tell-tale lamps where applicable. The console has an integral sunglasses bin with sprung and damped opening.

The mood lamp provides 'soft' illumination of the floor console and cup-holder area. The lamp is part of the backlight illumination circuit and therefore illuminates in synchronization with the side lamps. The level of back-lighting is determined by the dimmer control mounted within the auxiliary lighting switch; refer to **Instrument Cluster and Panel Illumination**.

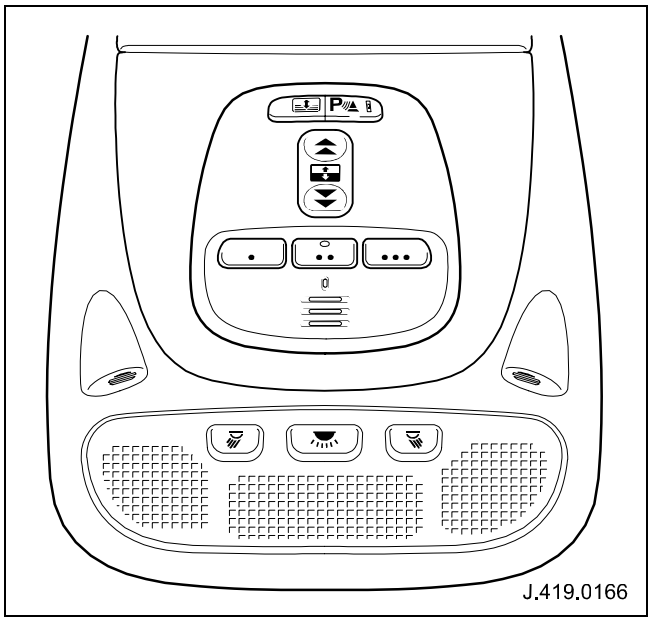


Fig. 160 Overhead console

The remote convenience transceiver, (where fitted), can be programmed to transmit up to three different radio frequencies, to activate garage doors, gates, home lighting, security systems or other radio frequency operated equipment.

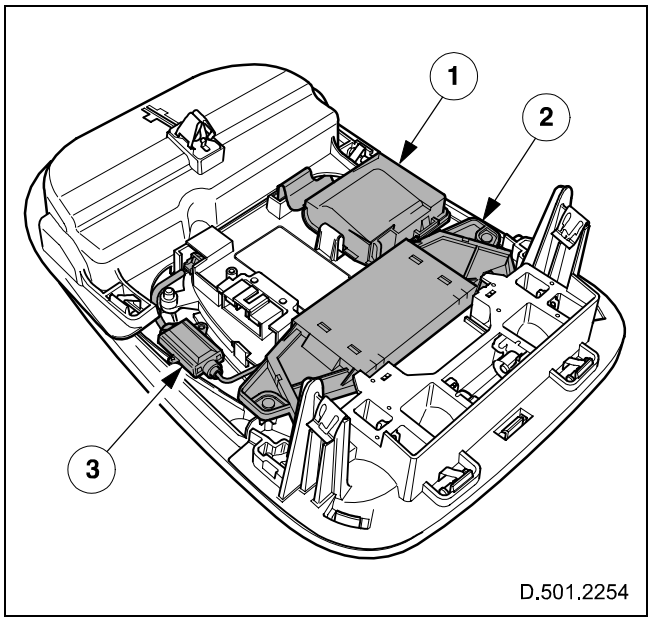


Fig. 161 Overhead console components

1. Remote convenience transceiver (garage door opener)
2. Intrusion sensors
3. Microphone amplifier

NOTE: Principal components of the overhead console are 'heat-staked' for robustness and consequently cannot be serviced separately; refer to **JTIS** for details.

Advanced Restraints System

Introduction

The continued development of the 'Advanced Restraint System' provides an improved overall level of crash protection for vehicle occupants. The system analyzes the occupancy scenario and crash severity before activating the appropriate safety devices to help better protect a range of occupants in a variety of crash situations. Benefits of the system include:

- Optimization of the deployment restraint devices and the reduction in potential for air bag induced injuries.
- The significant reduction in passenger air bag deployments (particularly when passenger seats are unoccupied) and a general reduction in all air bag deployments.

Some typical passenger position scenarios are illustrated in **Fig. 162**.

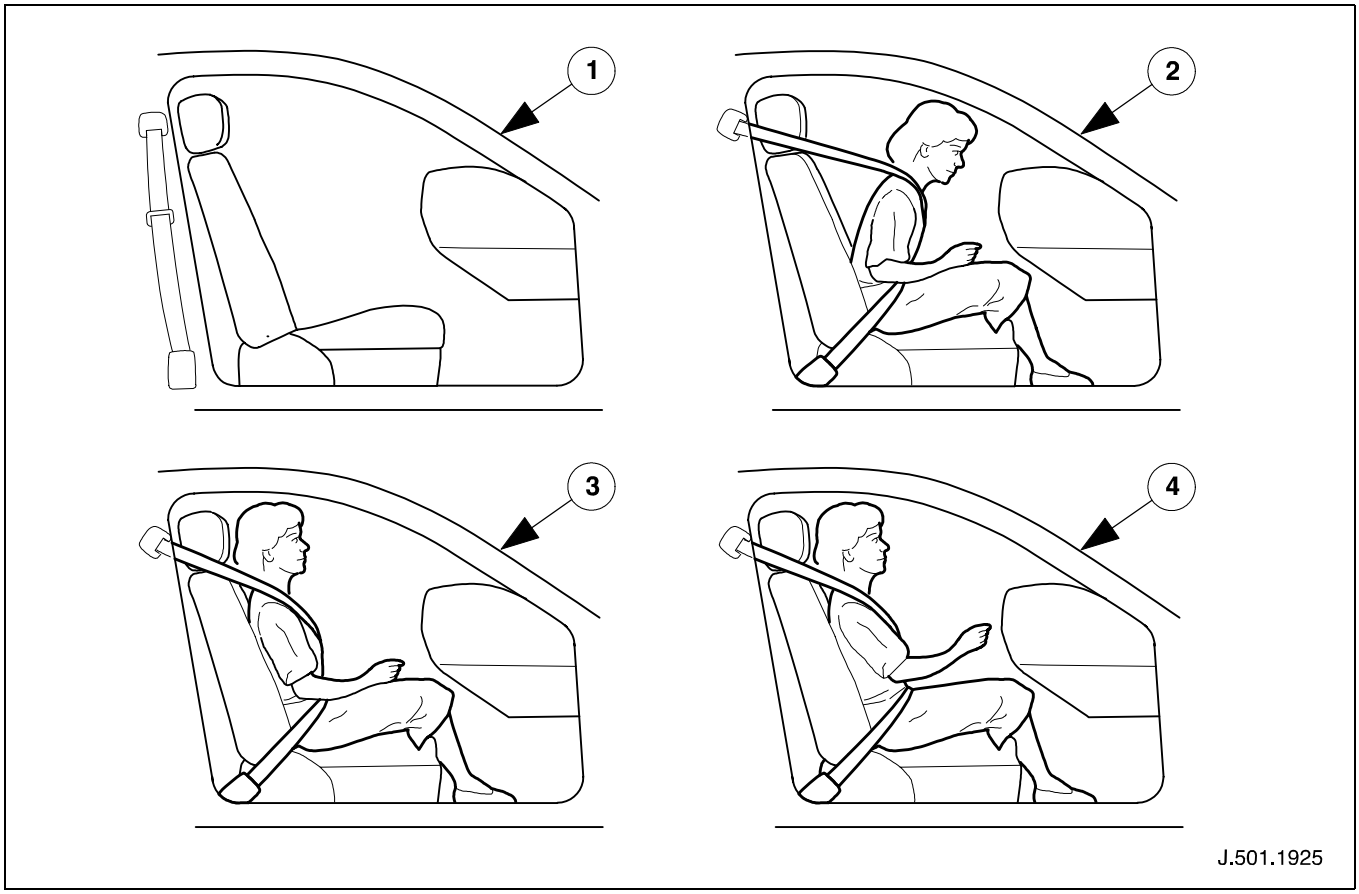


Fig. 162 Basic occupancy scenarios (passenger side)

1. Empty seat - No deploy
2. Out of position- No deploy
3. In position- Deploy
4. Extremities - No effect on deployment decision

In order to support the advanced restraint system requirements, a restraint control architecture has been introduced comprising the following systems or components:

- Passenger occupancy-sensing system
- All-electronic crash sensing with including frontal crash severity sensing and advanced restraints management.
- Driver air bag with twin stage inflator.
- Passenger air bag with twin stage inflator.
- Child seat lower ISOfix anchors for rear seats.
- Safety belt system including: front belt use detection, load limiting retractors and pre-tensioners.
- Rear safety belts with pre-tensioners.
- Front seats including: driver seat-track position sensor and passenger seat weight-sensing system.
- Lower steering column.
- Front seat-mounted side air bags.
- Side curtain air bags.

The systems diagram **Fig. 163** provides an indication of how the electrical component parts interact with each other; refer to **New XJ Range Electrical Guide** for detailed information.

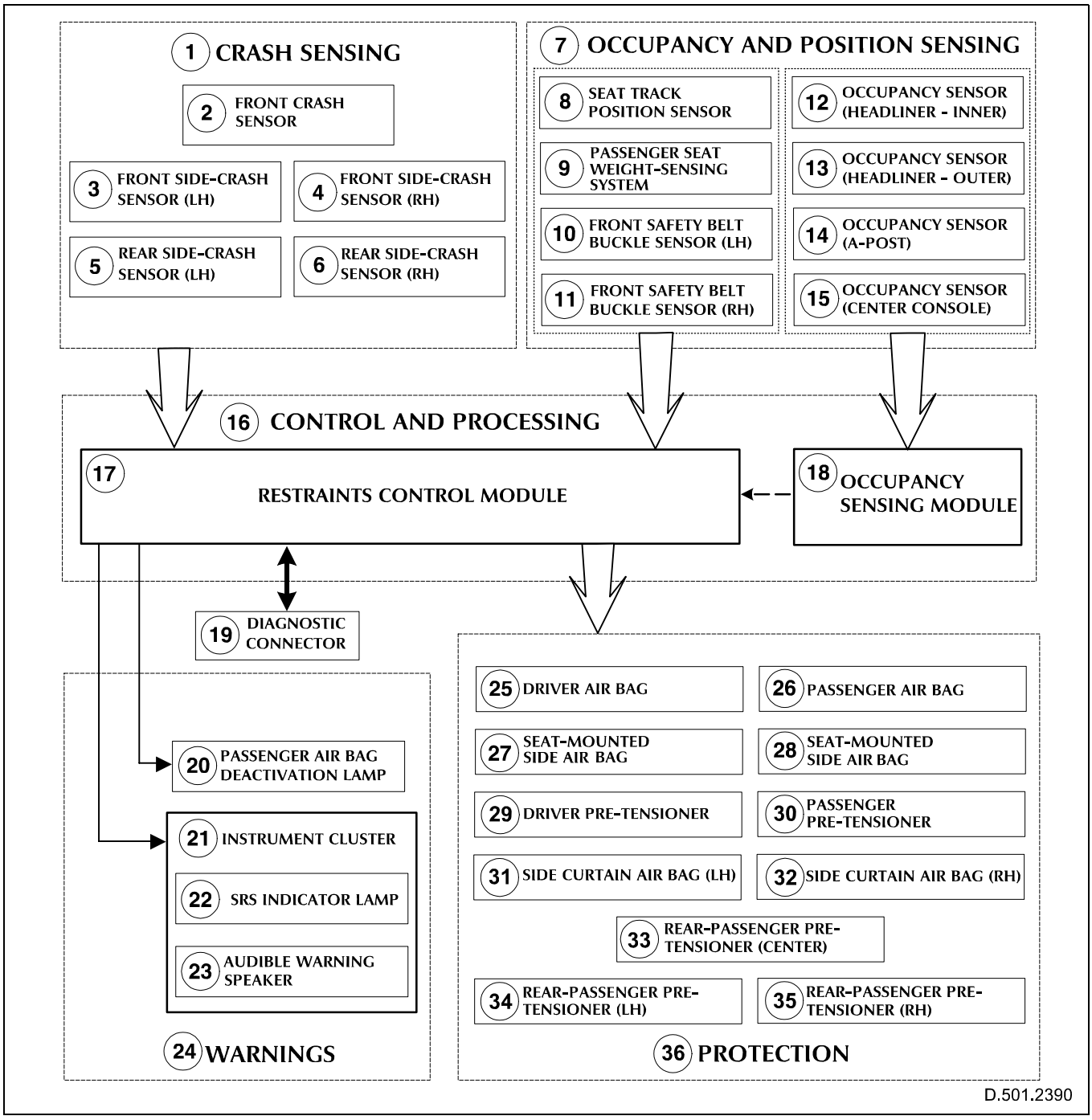

1 CRASH SENSING
2 FRONT CRASH SENSOR
3 FRONT SIDE-CRASH SENSOR (LH)
4 FRONT SIDE-CRASH SENSOR (RH)
5 REAR SIDE-CRASH SENSOR (LH)
6 REAR SIDE-CRASH SENSOR (RH)
7 OCCUPANCY AND POSITION SENSING
8 SEAT TRACK POSITION SENSOR
9 PASSENGER SEAT WEIGHT-SENSING SYSTEM
10 FRONT SAFETY BELT BUCKLE SENSOR (LH)
11 FRONT SAFETY BELT BUCKLE SENSOR (RH)
12 OCCUPANCY SENSOR (HEADLINER - INNER)
13 OCCUPANCY SENSOR (HEADLINER - OUTER)
14 OCCUPANCY SENSOR (A-POST)
15 OCCUPANCY SENSOR (CENTER CONSOLE)
16 CONTROL AND PROCESSING
17 RESTRAINTS CONTROL MODULE
18 OCCUPANCY SENSING MODULE
19 DIAGNOSTIC CONNECTOR
20 PASSENGER AIR BAG DEACTIVATION LAMP
21 INSTRUMENT CLUSTER
22 SRS INDICATOR LAMP
23 AUDIBLE WARNING SPEAKER
24 WARNINGS
25 DRIVER AIR BAG
26 PASSENGER AIR BAG
27 SEAT-MOUNTED SIDE AIR BAG
28 SEAT-MOUNTED SIDE AIR BAG
29 DRIVER PRE-TENSIONER
30 PASSENGER PRE-TENSIONER
31 SIDE CURTAIN AIR BAG (LH)
32 SIDE CURTAIN AIR BAG (RH)
33 REAR-PASSENGER PRE-TENSIONER (CENTER)
34 REAR-PASSENGER PRE-TENSIONER (LH)
35 REAR-PASSENGER PRE-TENSIONER (RH)
36 PROTECTION
D.501.2390

Fig. 163 Advanced restraints system diagram

Key to Fig. 163

1. Crash sensing
2. Front crash sensor
3. Front side-crash sensor (LH)
4. Front side-crash sensor (RH)
5. Rear side-crash sensor (LH)
6. Rear side-crash sensor (RH)
7. Occupancy and position sensing
8. Seat-track position sensor
9. Passenger seat weight-sensing system
10. Front safety belt buckle sensor (LH)
11. Front safety belt buckle sensor (RH)
12. Occupancy sensor (headliner - inner)
13. Occupancy sensor (headliner - outer)
14. Occupancy sensor (headliner - A-post)
15. Occupancy sensor (center console)
16. Control and processing
17. Restraints control module
18. Occupancy sensing module
19. Diagnostic connector
20. Passenger air bag deactivation lamp
21. Instrument cluster
22. SRS indicator lamp
23. Audible warning speaker
24. Warnings
25. Driver air bag
26. Passenger air bag
27. Seat-mounted side air bag
28. Seat-mounted side air bag
29. Driver pre-tensioner
30. Passenger pre-tensioner
31. Side-curtain air bag (LH)
32. Side-curtain air bag (RH)
33. Rear passenger pre-tensioner (center)
34. Rear passenger pre-tensioner (LH)
35. Rear passenger pre-tensioner (RH)
36. Protection

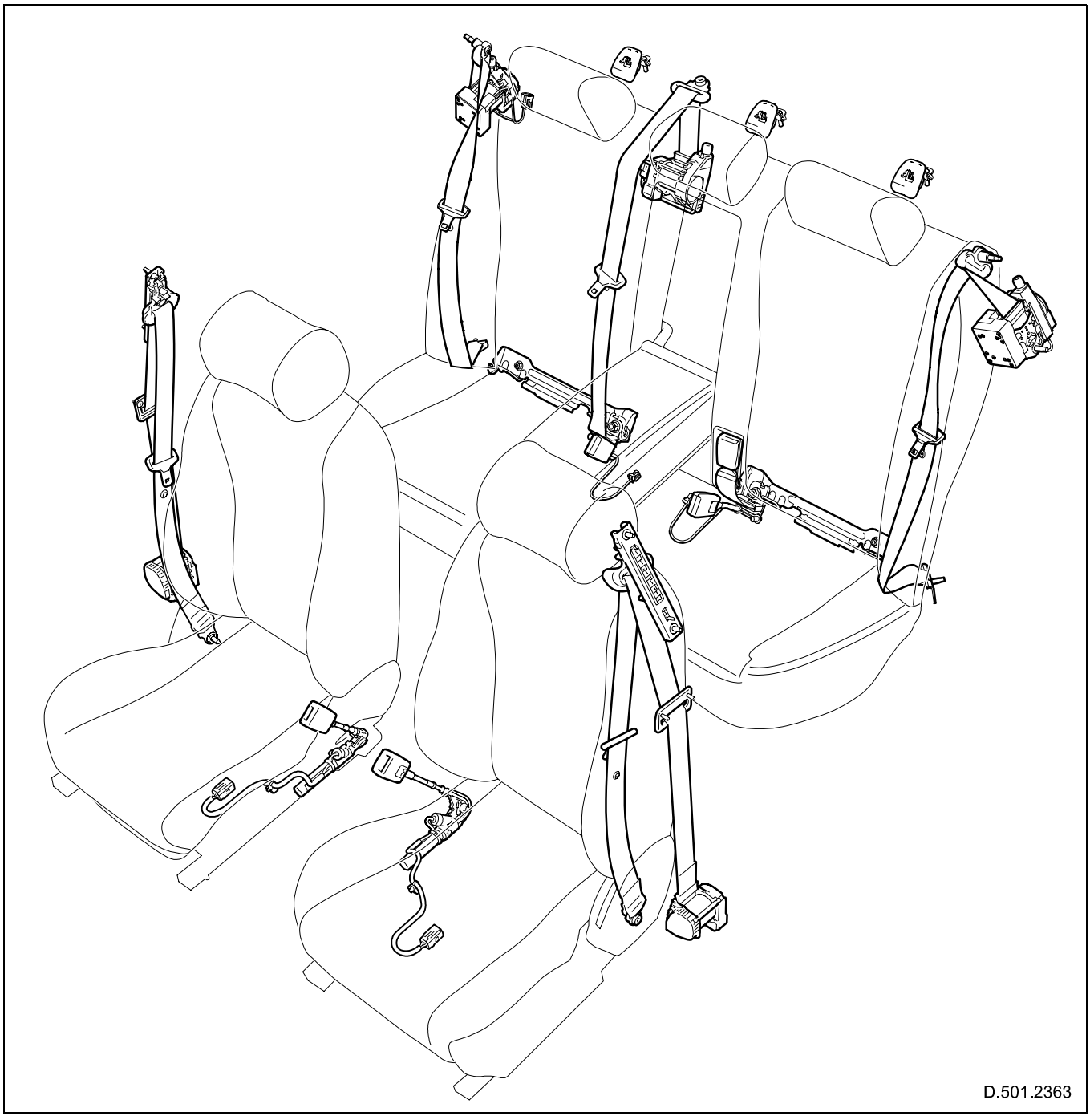


Fig. 164 Occupant restraints - location of active components

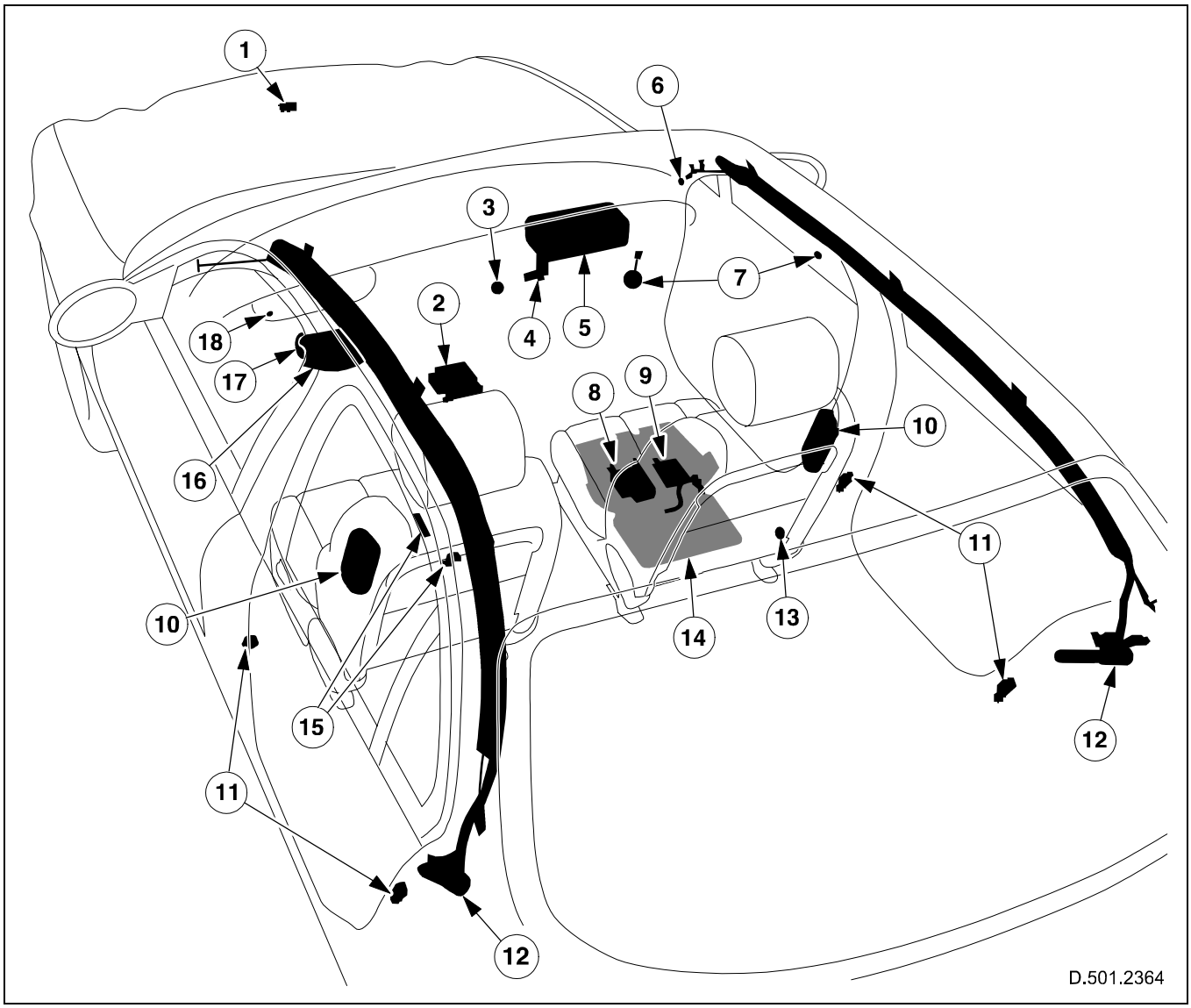


Fig. 165 Occupant restraints - location of passive components

1. Front crash sensor
2. Restraint control module
3. Occupancy sensor - center console
4. Passenger air bag deactivation indicator lamp
5. Passenger air bag module
6. Occupancy sensor - A-post
7. Occupancy sensors - headliner
8. Occupancy sensing module
9. Passenger seat weight-sensing module
10. Seat-mounted side air bag module
11. Side-crash sensor
12. Side-curtain air bag
13. Belt tension sensor (where applicable)
14. Passenger seat weight-sensing bladder
15. Seat-track position sensor
16. Driver air bag module
17. Clockspring
18. SRS indicator lamp

Crash Sensing

WARNING: Before commencing work on any part of the restraint system, the vehicle battery should be disconnected and a period of at least one minute allowed to elapse.

- The sensors do not contain any serviceable parts.
- Serial numbers of new parts should be logged against VIN for traceability.

Front Crash Scenario

The restraints control module (RCM), controls air bag deployment decisions by using signals from its internal accelerometer and the following sensors:

- Front crash sensor.
- Seat-track position sensor.
- Safety belt buckle sensor.
- Passenger seat weight-sensing system.
- Occupancy sensors.

Front Crash Sensor

The front crash sensor:

- is mounted on a bracket which is located in the center of the upper mounting crossmember;
- collects acceleration data from the front of the vehicle and sends it back to the RCM as an analogue signal;
- provides the main source of data that enables the RCM to gauge the severity of a frontal impact.

Side Crash Scenario

Data from the side crash sensors are used by the restraints control module (RCM), in conjunction with acceleration data from the RCM's internal accelerometer to make a deployment decision. The RCM processes the acceleration data and subject to an impact being of high enough severity, decides whether the seat-mounted side air bag should be deployed. The decision is forwarded to the deployment handler (within the RCM) which responds appropriately; for example: in the case that the data received indicates that the passenger seat is empty, or occupied by a small person, the passenger side air bag will be disabled.

NOTE: The appropriate side curtain air bag will still deploy to afford protection for any corresponding rear occupant.

Side Crash Sensors

The side crash sensors:

- Comprise accelerometer and processing circuits but do not make deployment decisions.
- The front side-crash sensor is mounted behind the B-post trim close to the safety belt retractor fixing.
- The rear side-crash sensor is mounted directly to the vehicle body at a rear mid-wheel location, close to the rear lower safety belt anchor.

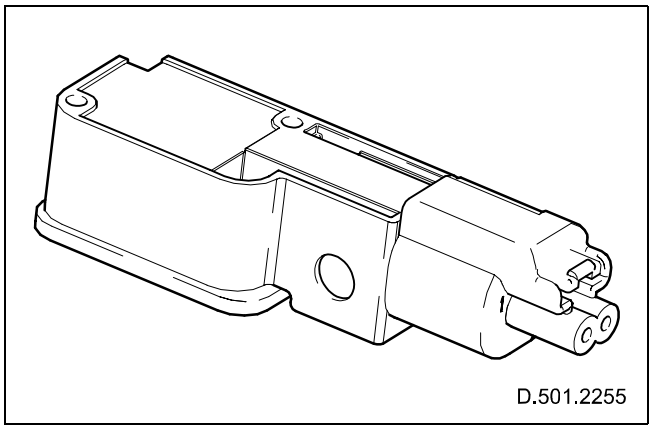


Fig. 166 Crash sensor

Occupancy and Position Sensing

Seat-track Position Sensor

The seat-track position sensor, a 'Hall effect' type, is fitted to the underside of the driver's seat. The sensor is actuated by the magnet that is attached to the seat slide; refer to **Fig. 167**. The magnetic field disturbance caused when the magnet passes the sensor, creates an output signal for the RCM. On receipt of this signal, which indicates when the seat is forward of a defined point in its travel, the RCM disables the second stage output of the driver air bag. Malfunction of the sensor or associated circuits will cause the SRS indicator lamp to illuminate. Diagnosis must be undertaken using WDS.

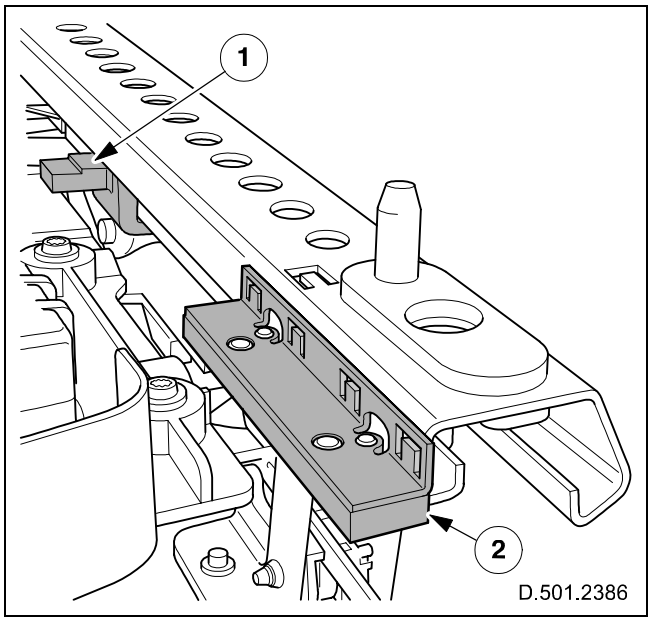


Fig. 167 Seat-track position sensor

1. Hall effect sensor
2. Magnet

Safety Belt Buckle Sensor

The safety belt buckle sensor is a 'Hall effect' type, which provides an output signal in response to the magnetic field disturbance caused by the insertion of the safety belt tongue into the buckle. The output signal from the sensor is used by the RCM to determine whether the front seat occupants are correctly restrained. Malfunction of the sensor or associated circuits will cause the SRS indicator lamp to illuminate. Diagnosis should be undertaken using WDS.

The Hall effect sensor is used in conjunction with the other components of the advanced restraint system to ensure that air bag and safety belt deployment only occurs where necessary.

Passenger Seat Weight-Sensing System

The seat weight-sensing system forms part of a strategy to control passenger air bag deployment depending on the occupancy scenario. The strategy also takes into account the data received from the occupancy sensors; refer to **Occupancy Sensors**.

NOTE: The seat weight-sensing system does not comprise any serviceable items.

The following components are combined and calibrated during manufacture to form the seat weight-sensing system:

- Passenger seat cushion.
- Silicone-filled bladder (integrated into the passenger seat cushion).
- Seat weight-sensing module (mounted under the seat).
- Pressure sensor (attached to the bladder and mounted under the seat).

NOTE: In some markets, the belt tension sensor (an integral part of the front passenger safety belt seat-anchor) has been introduced; refer to **Belt tension sensor**.

Locations for the seat weight-sensing components are shown in **Body, Seats, Fig. 142**.

The silicone-filled bladder responds to weight changes on the passenger seat. The pressure sensor responds to these pressure changes and provides an appropriate signal to the seat weight-sensing module. In addition, the belt tension sensor (where applicable), provides a separate input to the seat weight-sensing module; refer to **Belt tension sensor**. The module processes the input signals received from the sensors and forwards an appropriate signal to the restraints control module (RCM) via the local CAN. In addition, the module performs self-diagnostic functions on the system, with any malfunctions being notified to the RCM accordingly. Malfunction of the sensing system or associated circuits will cause the SRS indicator lamp to illuminate. Diagnosis of the system can only be undertaken using WDS; refer to **JTIS** for further information.

The seat weight-sensing system responds to the occupancy of the front passenger seat in accordance with **Table 9**. The advanced restraints system via the RCM, monitors and processes the data from the seat weight-sensing system and several other sensors, before making a deployment decision; refer to the advanced restraints system diagram **Fig. 163**. The system is designed to take account of several variables in addition to weight, including: inclination of the vehicle; exact position and structure of the weight on the seat.

NOTE: The seat weight-sensing system cannot discriminate between a passenger and an object.

Passenger seat status	Passenger air bag status	Passenger air bag deactivation lamp status
Empty	OFF	OFF
Occupied (small occupant)	OFF	ON
Occupied (large occupant)	ON	OFF

Table 9 Passenger seat weight-sensing system

Service Kit

Individual components of the seat weight-sensing system are not serviceable; the system must be replaced as a complete unit. Due to the sophistication of the weight-sensing system, each replacement system requires calibration. To avoid the need to provide each dealer with calibration equipment, a pre-calibrated service kit assembly is available. The kit has two fixed connectors and a single connector to interface with the vehicle harness. After installation, the system will require initialization by WDS; refer to **JTIS** for further information.

Belt tension sensor

The belt tension sensor (BTS) is a strain-gauge type, encapsulated within the passenger safety belt anchor. The sensor converts the force applied to the belt into an electrical signal. In the event that a child-seat is installed onto the front passenger seat (not recommended), the force applied to the passenger safety belt is reflected by the output signal from the sensor, which provides data to supplement that received from the silicon bladder. The passenger seat weight-sensing module processes the input data and makes it available to the restraints control module (RCM), which then makes the necessary adjustments in respect of passenger air bag deployment.

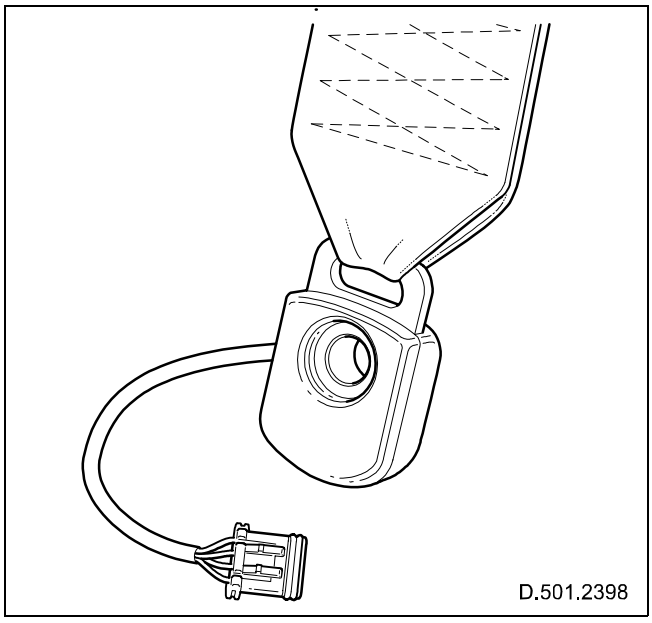


Fig. 168 Belt tension sensor

Occupancy Sensors

The occupancy sensors form part of a strategy to control passenger air bag deployment, depending on the occupancy scenario; refer to **Fig. 162**. The strategy also takes into account the data received from the seat weight-sensing system; refer to **Passenger Seat Weight-Sensing System**.

The occupancy sensor system uses ultrasound at an operating frequency of 40 kHz to monitor passenger seat occupancy.

NOTE: Medical studies have shown that frequencies within this range do not present any danger or discomfort.

The advanced restraints system uses four ultrasonic sensors, one at the passenger-side A-post, one in the center console and two in the headliner assembly; refer to **Fig. 165**.

The sensors:

- are strategically placed to detect the presence and movement of the front passenger seat occupant;
- determine the presence and position of the front seat occupant with respect to the passenger air bag deployment door;
- determine air bag deployment decisions by classifying occupants as either 'in position''or 'out of position';
- are part of a system that is sophisticated enough to be unaffected by body extremities; refer to **Fig. 162**.

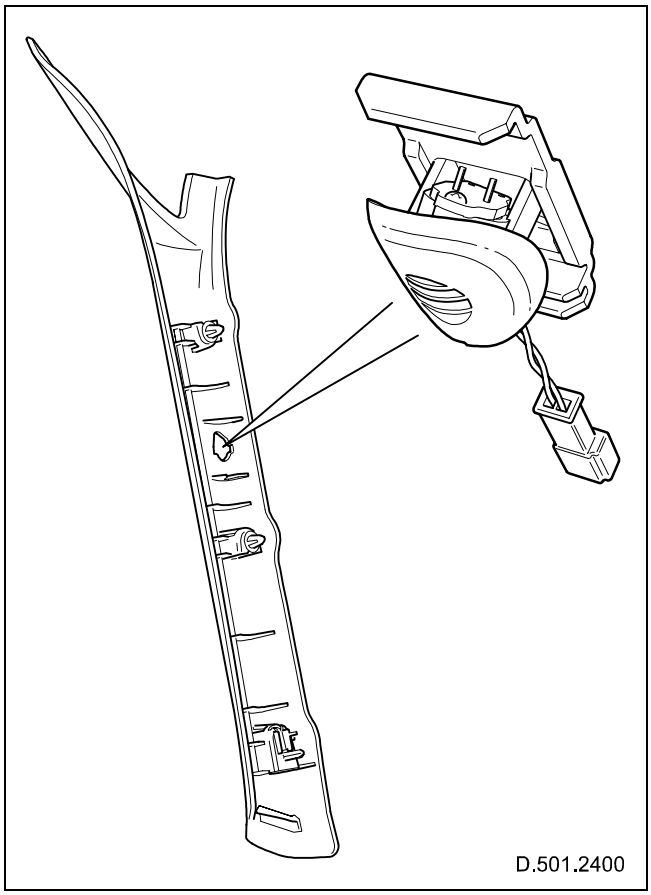


Fig. 169 Occupancy sensor - A-post

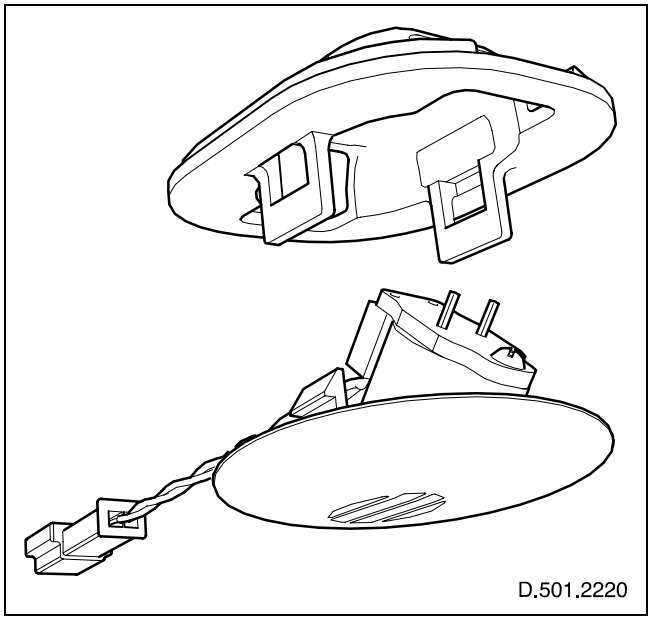


Fig. 170 Occupancy sensor - headliner

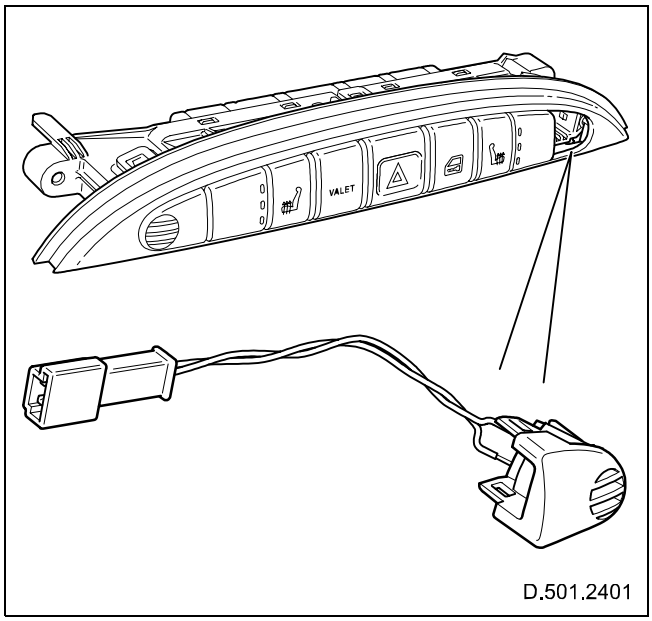


Fig. 171 Occupancy sensor - center console

The occupancy sensing module constantly monitors and processes the signals received from the occupancy sensors; refer to **Occupancy Sensing Module**. Data from the sensors is correlated by the occupancy sensing module and used to decide when the front passenger seat occupant has leaned into an area in front of the passenger air bag door, known as the 'keep-out zone'.

NOTE: The system is designed to ignore body extremities (hands, feet) and respond only to head or body movements. When the passenger leans forward into the zone, the system will disable the passenger air bag and provide visual confirmation by illuminating the passenger air bag deactivation lamp; refer to **Passenger Air Bag Module**.

The RCM uses the data received from the occupancy sensing module, in conjunction with data from other sensors in the system (refer to **Fig. 163**), to make deployment decisions; refer to **Restraints Control Module**.

Refer to **JTIS** for sensor servicing information and to **New XJ Range Electrical Guide** for connection information.

Control and Processing

Restraints Control Module

Internally, the restraints control module (RCM) has two areas that determine which elements of the restraint system are to be deployed:

Area 1 - Crash severity evaluation

The first area evaluates crash severity by using data from the RCM's internal accelerometer, the front crash sensor and the safety-belt buckle sensor. Based on this data, the RCM decides which level of air bag deployment is required and forwards the information to the second area, the deployment handler.

Area 2 - Deployment handler

The status of the seat-track position sensor, occupancy sensors, seat weight-sensing system and safety-belt buckle sensors are examined before a decision is made about which restraints should finally be deployed. For instance, if the occupancy sensing and seat weight-sensing system indicates that the passenger seat is empty, then no restraint deployment will take place on the passenger side, even if full deployment takes place for the driver.

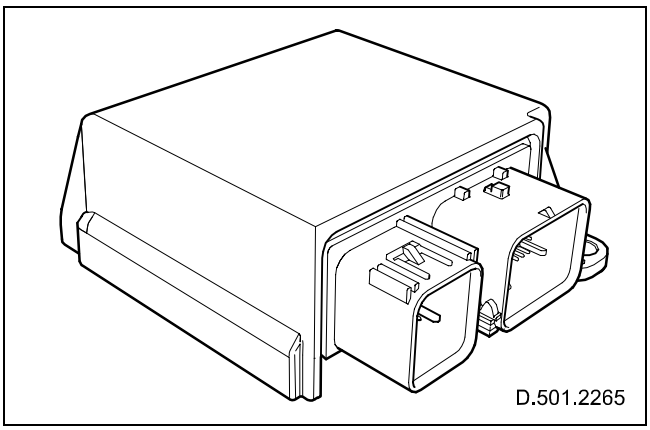


Fig. 172 Restraints control module

The restraints control module:

- Is fixed to the top of the driveshaft tunnel below the center console.

NOTE: Due to the importance of the module being securely fixed to the vehicle body, the ground connection is made via the fixings and is monitored by the diagnostic system. A bad connection causes a diagnostic trouble code (DTC) to be generated. Refer to **JTIS** for the correct torque figures.

- Identifies severity and direction of impact and makes decision on deployment of air bags and pre-tensioners.
- Provides firing signals to all air bags and pre-tensioners.
- Performs on-board testing of the air bag and pre-tensioner firing circuits, warning indicator circuits and module status (the front and side-crash sensors perform basic self-tests).
- Stores DTCs.
- Drives the SRS indicator lamp on the instrument cluster: if the warning lamp fails and there is an additional malfunction within the system (DTC recorded) a secondary-warning audible tone is emitted.
- In the event of a crash, sends a signal to the vehicle emergency message system (VEMS) and the ECM to indicate that a crash has occurred.
- Is connected to the diagnostic connector via the ISO data bus to enable communication with WDS or scan-tool.
- In the event of loss of battery supply in crash conditions, provides a temporary back-up power supply (100ms after the RCM loses its supply) to operate the front air bag modules and pre-tensioners.
- In the event of a crash, records certain data for subsequent access via the diagnostic connector. This data includes deceleration information, firing delay and DTCs.

NOTE: Diagnosis of any malfunctions relating to the adaptive restraints system must always be undertaken using WDS.

Occupancy Sensing Module

The module:

- is located beneath the front passenger seat;
- processes signals received from the occupancy sensors; refer to **Occupancy Sensors**;
- processes signals received from the seat weight-sensing system; refer to **Passenger Seat Weight-Sensing System**;
- makes data available to the RCM via a local CAN.

Safety Belts

In appropriate markets, all passenger safety belts (not the driver's) have an integral automatic locking retractor (ALR), providing a 'static reel mode' for use with child seats. When activated, the static reel mode prevents further extraction of the belt and locks the child seat firmly in position.

The static reel mode is activated by pulling the belt to its full extension to engage the ratchet mechanism. After ensuring the child seat is in the required position the belt tongue should be inserted into the buckle and the belt allowed to slowly retract back onto the reel (a ratchet operation may be felt as the belt retracts) until it fits snugly around the child seat.

Unbuckling the belt and allowing the webbing to fully retract will disengage the ALR feature.

NOTE: Safety belts are not serviceable items. As with all electronically monitored, occupant safety components, the SRS indicator lamp will illuminate if a DTC has been stored. Diagnosis must be undertaken using WDS.

WARNING: Prior to the removal of safety belts and before disconnecting safety belt electrical connectors, the vehicle battery should be disconnected and a period of at least one minute allowed to elapse. The same amount of care should be taken when handling and storing safety belts, as would be taken when handling and storing air bag modules.

The front safety belt retractors incorporate a load limiting device, that allows progressive 'payout' of additional safety belt webbing when the force exerted exceeds a predetermined limit.

NOTE: Each front safety belt buckle assembly incorporates a 'Hall effect' sensor; refer to **Safety Belt Buckle Sensor**. In some markets, a belt tension sensor is incorporated into the front passenger, lower safety belt anchor; refer to **Belt tension sensor**.

Front Safety Belt Warning Reminder

NOTE: To suit market legislation, the feature can be activated or disabled as appropriate.

- When the front passenger seat is unoccupied, the reminder will pertain only to the driver's safety belt and will cease when the belt is buckled.
- When the front passenger seat is occupied, the reminder will pertain to both safety belts and will cease only when **both** belts are buckled.

NOTE: The presence of a front seat passenger is detected by the **Passenger Seat Weight-Sensing System**.

Provided the reminder feature is activated, detection of an unfastened front safety belt is indicated by the illumination of the safety belt warning lamp and an audible warning.

NAS functionality

For the first 60 seconds after the ignition key has been turned to position 'II'/'III':

- If the driver's safety belt is unfastened, the safety belt warning lamp will remain illuminated and be accompanied by a single six-second audible warning.
- Fastening the driver's safety belt will cause the warnings to cease.
- Failure to fasten the driver's safety belt will cause the audible warning to cease after 6 seconds and the warning lamp to extinguish after 60 seconds.
- After 75 seconds have elapsed, the reminder feature will operate as described for rest-of-world functionality.

Rest-of-world functionality

An intermittent audible warning will start/resume and the safety belt warning lamp will flash under the following conditions:

- a front seat occupant is present and their safety belt is unfastened;
- the vehicle is travelling at a speed greater than 10 mile/h (16 km/h).

The warning will remain active for a 5 minute period, every 30 seconds during this period, the intermittent audible warning and flashing lamp will be evident for 10 seconds. These incremental warnings will cease when either of the following conditions are satisfied:

- front seat occupants fasten their safety belts;
- the vehicle is halted.

Disabling the reminder

The front passenger seat must be unoccupied and the following steps completed within 60 seconds:

1. Turn the ignition key to position 'II' (do not start the engine).
2. Repeat the following actions, nine times:
   – fasten the driver safety belt buckle, check the safety belt warning lamp extinguishes and then unfasten the driver safety belt buckle, check the safety belt warning lamp illuminates.

   NOTE: After completion of step 2, a single chime confirms that the reminder feature has been disabled.

Enabling the reminder

The procedure for enabling the reminder is identical to the disabling procedure.

Pyrotechnic pre-tensioners

The pre-tensioner will only be activated when the restraints control module (RCM) sends an appropriate firing signal; refer to **Control and Processing**.

The pre-tensioners are:

- designed to remove excess webbing from the safety belt in the event of a crash;
- deploy very quickly and early on in the crash before the occupant starts loading the safety belt.

WARNING: In the event that a pre-tensioner deploys, the complete safety belt system (front and rear) must be replaced; refer to JTIS.

The front safety belts employ buckle-type pre-tensioners; refer to **Fig. 173**.

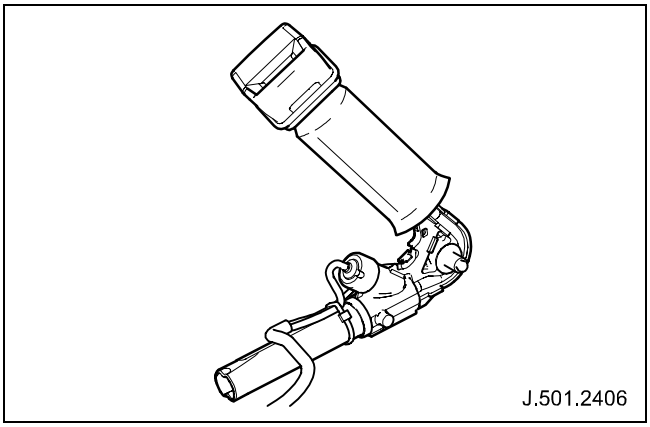


Fig. 173 Buckle-type pre-tensioner

The rear safety belts employ retractor-type pre-tensioners; refer to **Fig. 174** and **Fig. 175**.

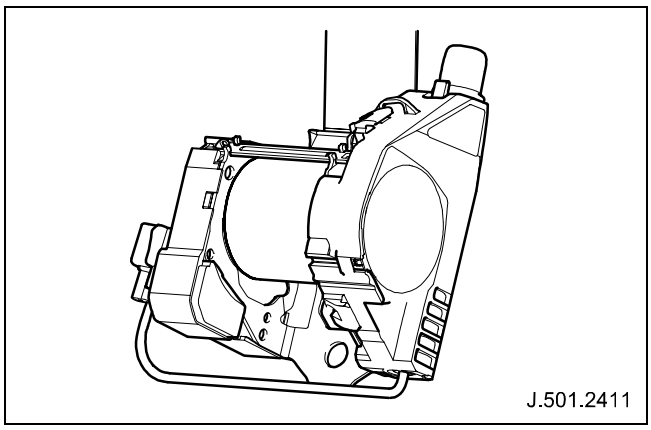


Fig. 174 Retractor-type pre-tensioner (rear center)

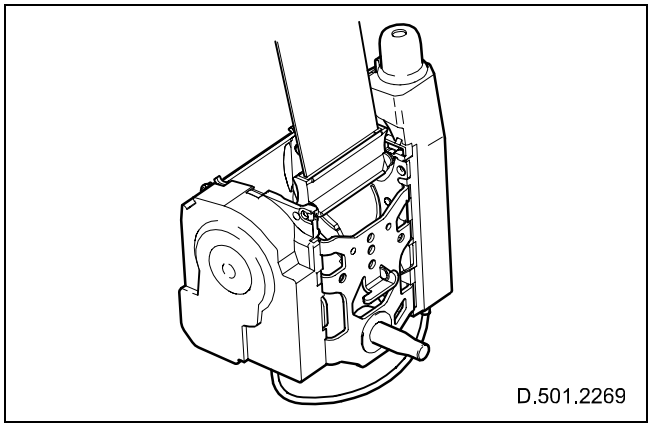


Fig. 175 Retractor-type pre-tensioner (rear left-hand)

Rear Safety Belt Comfort System

NOTE: The following applies only to vehicles fitted with electrically adjustable rear seats.

The rear safety belts for the outboard positions have an integral comfort solenoid, designed to be activated when the belts are fastened. During the period that a belt remains fastened, the solenoid switches operation from the retraction spring to a comfort spring, which reduces the force exerted on the occupant by the safety belt webbing. When the belt is unfastened, the comfort solenoid disengages the comfort spring, re-engages the retraction spring and causes the force on the webbing to immediately revert to the standard retraction mode.

Anti-whiplash System

In order to reduce the incidence of whiplash injuries, two anti-whiplash mechanisms (one either side) are incorporated into each front seat. The mechanisms are designed to respond to rear impacts at low speeds, by controlling the rearward motion of the backrest to reduce the likelihood of neck injuries.

Depending on the weight of the seat occupant and the severity of the collision, the mechanisms begin to operate at collision speeds between approximately 8.7 and 11.2 mile/h (14 and 18 km/h).

Immediately after a rear impact, the seat forces the backrest against the occupant (**Fig. 176A**). At this point the mechanism is activated and progresses through a controlled phase of movement:

1. the backrest moves rearwards (but in an upright position) for a distance of approximately 50mm (**Fig. 176B**);
2. the backrest tilts rearwards (**Fig. 176C**) but is limited to an angle of approximately 15 degrees.

The combined effects of movements 1 and 2, absorb impact energy, reducing the relative acceleration of the head and body.

NOTE: The positioning of items behind the front seats will prevent the activation of the mechanism (**Fig. 176D**).

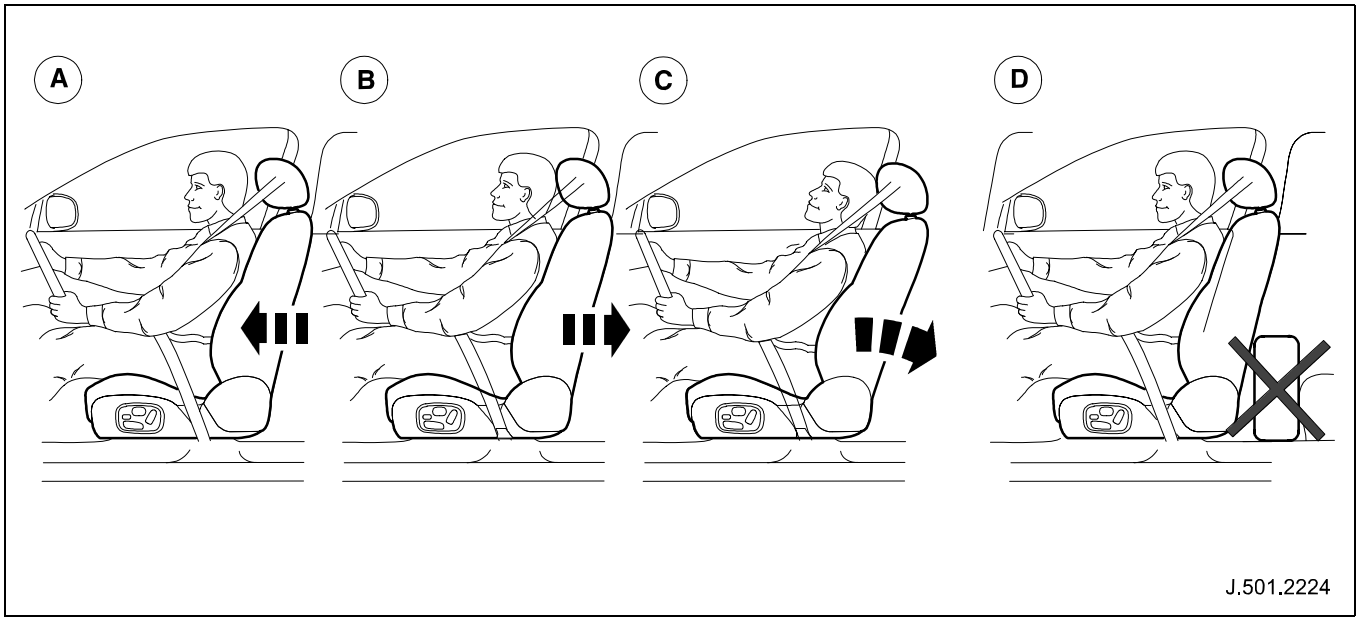


Fig. 176 Anti-whiplash feature

With reference to **Fig. 177**, the mechanism has been engineered so that during a rear impact collision, the movement of the recliner plate (7) and backrest, is controlled. This is achieved by constraining the movement of the guide-pin (4) within the window (3) of the outer side-plate (1).

NOTE: The displacement of the guide-pin in the window, will vary depending on occupant weight, occupant posture and the impact severity.

The tilting movement of the backrest is determined by the design parameters of the deformation link (5) which collapses (**Fig. 177C**) to provide gentle braking.

NOTE: The shape of the window, the angle between the two links (**Fig. 177B**) and the return spring (2), prevents the mechanism from being activated during normal driving.

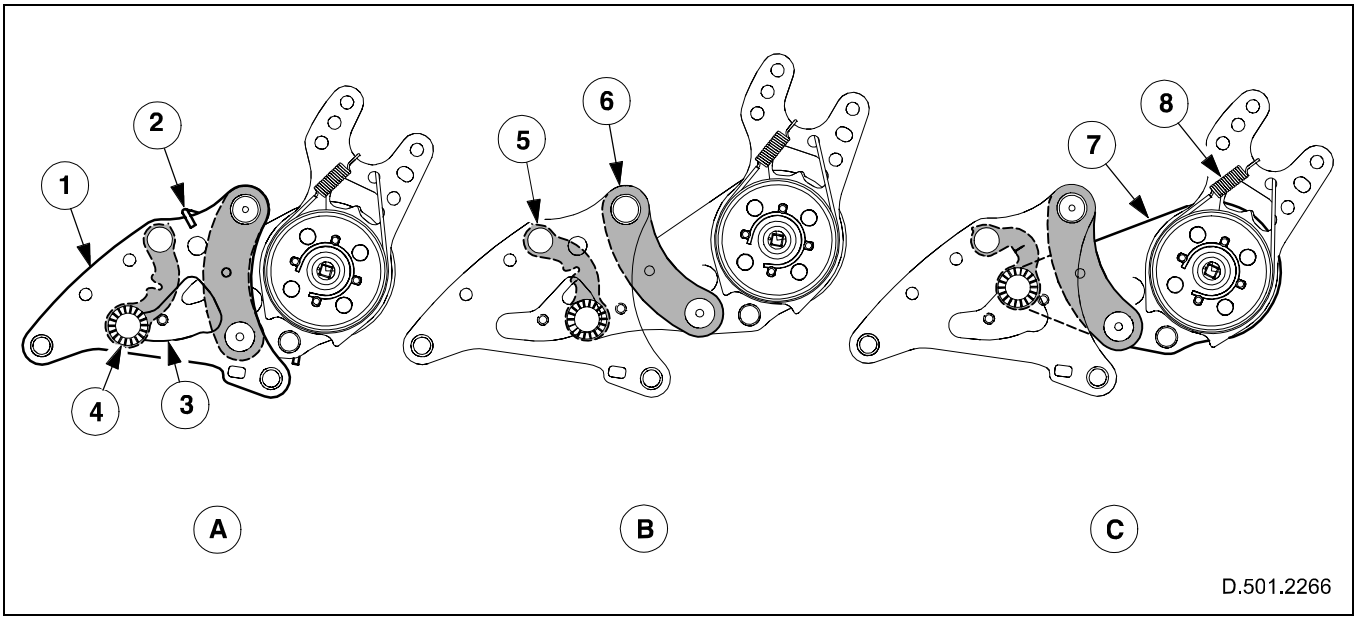


Fig. 177 Anti-whiplash mechanism (left-hand side)

A. Installed condition
B. Fully rearwards condition
C. Fully deployed condition
1. Outer side-plate
2. Return spring
3. Window
4. Guide-pin
5. Deformation link
6. Rear link
7. Recliner plate
8. Brake spring

NOTE: The anti-whiplash mechanism has no serviceable components. In the case of a minor collision, even though the protective system has been activated, there may be no apparent change to the seat. The seat must always be inspected after a rear collision; refer to **JTIS**.

Air Bag Modules

Driver Air Bag Module

The driver air bag module is controlled by the restraints control module (RCM), which chooses between first or second stage deployment, depending on driver seat buckle usage, the seat position and crash severity.

NOTE: Variation in driver air bag deployment is determined by the timing of the first and second stage ignition signals. This facilitates adaptation of the stiffness and timing of the air bag to optimize occupant protection.

The module comprises:

- A twin stage inflator as opposed to the single stage inflator.
- Separate chambers for the two inflation stages, each independently activated by the RCM.
- Two air bag connectors, that have foolproof mechanical keying and are color coded to the respective plug on the inflator.
- A non-azide propellant that reduces particulates and effluents.

The air bag deploys radially, to reduce the risk of air bag induced injury to a driver that is positioned close to the steering wheel.

NOTE: Disposal of twin stage air bags is different to single stage air bags; refer to **JTIS**.

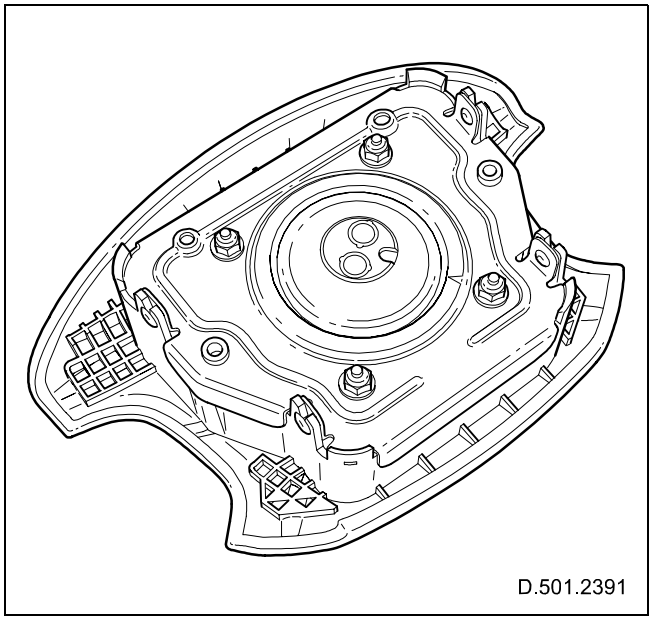


Fig. 178 Driver air bag module

Passenger Air Bag Module

The module is attached to a mounting bracket which is in-turn attached to the cross-car beam; refer to JTIS.

The module comprises:

- A twin-stage inflator as opposed to the single-stage inflator.
- Two air bag connectors to accommodate the twin-stage inflation.

The heated gas inflator:

- Comprises a high-pressure mix of clean air and hydrogen gas, triggered by two separate igniters.
- Produces a controlled generation of clean gas to rapidly fill the air bag.
- Is classified as a stored flammable gas (not as an explosive) and as such, has less restrictive storage and transportation requirements.
- Produces a very clean burn and almost no particulates.
- Is almost free of any toxins, making disposal or recycling much easier.

NOTE: Disposal of twin-stage air bags is different to single-stage air bags; refer to **JTIS**.

The passenger air bag module is controlled by the restraints control module (RCM), which chooses between first or second-stage deployment, depending on occupant status and crash severity.

NOTE: Variation in passenger air bag deployment is determined by the timing of the first and second-stage ignition signals. This facilitates adaptation of the stiffness and timing of the air bag to optimize occupant protection.

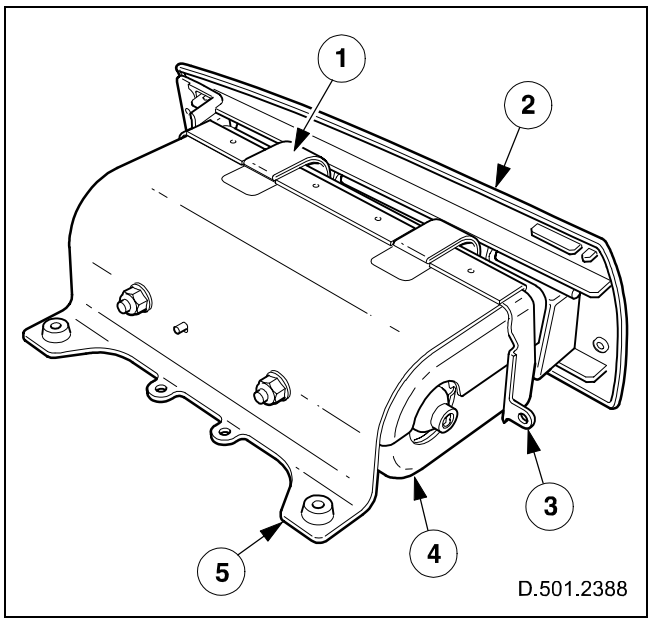


Fig. 179 Passenger twin-stage air bag module

1. Webbing straps
2. Air bag deployment door
3. Tether bar
4. Passenger air bag module
5. Mounting bracket

Passenger Air Bag Deployment Door

The passenger air bag deployment door is clipped into the instrument panel and tethered to the mounting bracket via webbing straps.

NOTE: Removal of the door complete with webbing straps and tether bar can only be achieved after removing the passenger air bag module; refer to **JTIS**.

The passenger air bag deployment door incorporates a lens that displays the air-bag deactivated symbol.

NOTE: In some markets, the symbol may be replaced by the phrase 'PASS AIRBAG OFF'.

The lens is backlit by the air-bag deactivation indicator lamp, which is mounted in a separate housing attached to the instrument panel. The illumination of the lens is designed to inform the front seat occupants whether or not the passenger air bag has been deactivated; refer to **Occupancy and Position Sensing**.

NOTE: The lamp is not a serviceable item; the complete housing must be changed; refer to **JTIS**.

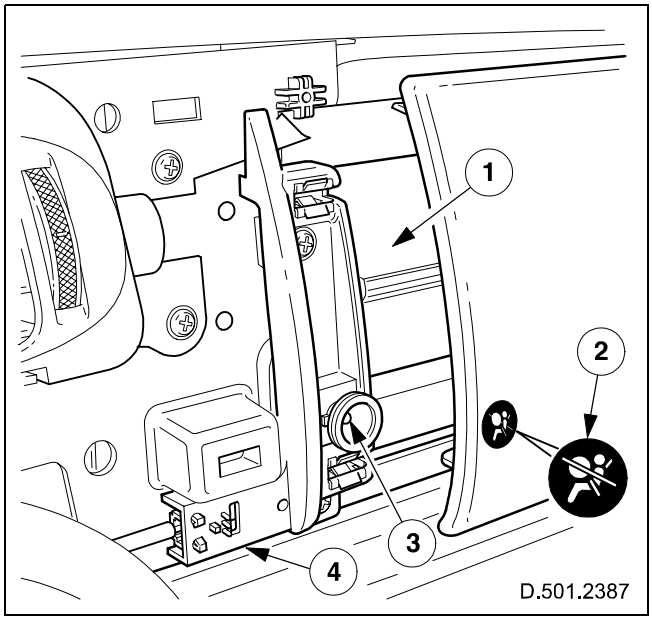


Fig. 180 Passenger air bag deactivation

1. Air bag module
2. Air bag deactivation indicator lens
3. Air bag deactivation indicator lamp
4. Air bag deactivation indicator lamp housing

Seat-Mounted Side Air Bag Module

The seat-mounted side air bag module is designed to provide protection for the thorax (the part of the torso between the neck and the abdomen). The module:

- is mounted in the outboard bolster of each front seat;
- is standard fit and specification in all markets;
- does not require routine maintenance;
- has no serviceable parts;
- uses compressed argon to inflate the bag.

NOTE: As with all occupant safety components, the SRS indicator lamp will illuminate if a DTC has been stored. Diagnosis must be undertaken using WDS.

In an air bag deployment situation, the air bag deploys through the stitched seam in the side bolster. A chute has been designed into the inside of the trim cover to ensure the air bag always emerges at the same point.

WARNING: In a service situation, the module must be correctly located in the chute. Failure to follow the service procedure could result in incorrect air bag deployment; refer to JTIS.

NOTE: In the event of a side impact that is sufficient to deploy the bag, it will be necessary to replace the complete seat.

Side-Curtain Air Bag

The side-curtain air bag comprises:

- Attachment brackets (p-clips).
- Fill tube.
- Air bag.
- Housing.
- Inflator.
- Front/rear tethers.

The side-curtain air bag:

- is standard fit and specification in all markets;
- is located under the headliner and stabilized at the A-post and C-post by tethers;
- does not require routine maintenance;
- has no serviceable parts;
- uses compressed argon to inflate the air bag;
- deploys to coincide with seat-mounted side air bag deployment.

NOTE: If the passenger air bag is deactivated, the corresponding seat-mounted side air bag is also deactivated, however the side-curtain air bag will still deploy to afford protection to any corresponding rear occupant.

- After deployment, the side-curtain air bag extends down to approximately shoulder height providing head protection for both the front and rear occupants.

The inflator:

- generates the gas needed to fill the air bag;
- consists of a high strength steel casing filled with a solid propellant charge, an electrically activated igniter and a cold gas bottle containing pressurized gas.

When appropriate, the restraints control module (RCM) sends a signal to the igniter causing the following sequence of events:

- the propellant is ignited;
- the burning propellant opens the membrane of the cold gas bottle and heats the pressurized gas;
- the expanding gas is directed into the fill tube by the inflator housing assembly;
- the gas emerges through holes in the fill tube and enters the front and rear side-curtain air bag chambers.

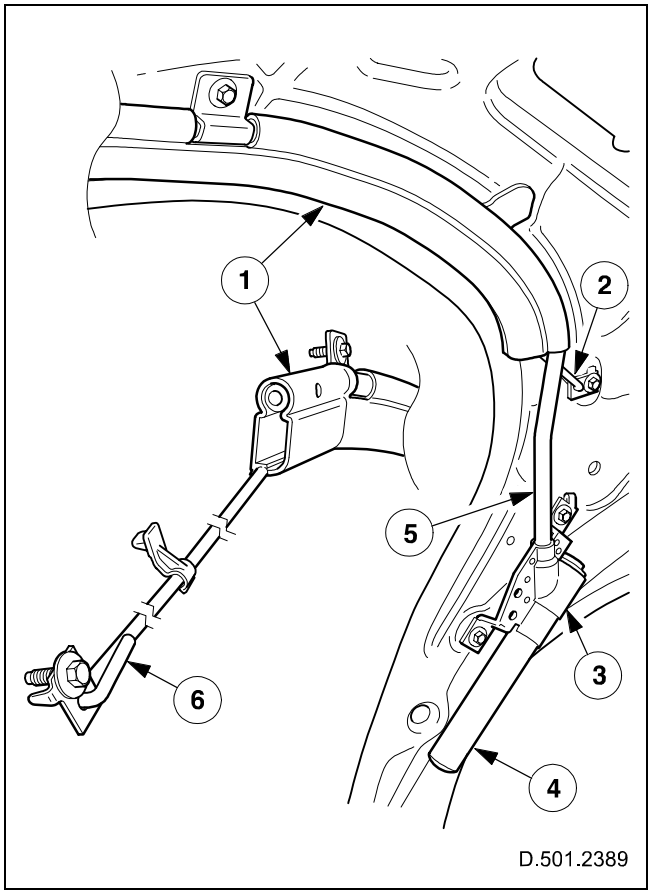


Fig. 181 Side curtain air bag

1. Housing
2. Rear tether
3. Inflator housing assembly
4. Inflator
5. Fill tube
6. Front tether

Steering Column

The steering column is an integral part of the occupant safety system; refer to **Chassis, Steering System, Steering Column**.

Clockspring

The clockspring provides a flexible coupling for electrical connection of components that are attached to the steering wheel, including:

- horn;
- speed control buttons;
- telematics control buttons;
- driver air bag module.

NOTE: The clockspring has two electrical connectors that interface between the twin-stage driver air bag module and the restraints control module (RCM); refer to **Driver Air Bag Module**.

Vehicles installed with the heated steering wheel option have an additional power coupling; refer to **Climate Control System**, **Heated Steering Wheel**.

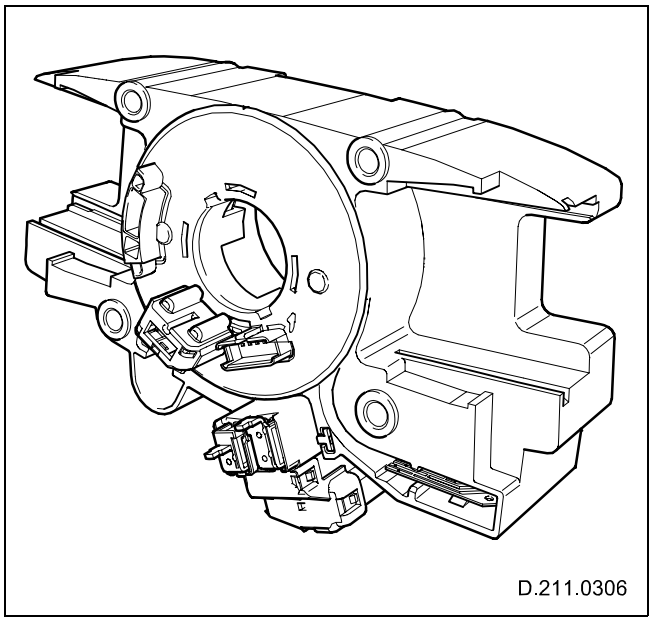


Fig. 182 Clockspring

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XJ

JAGUAR

JAGUAR A UNIQUE APPEAL

The Jaguar name instils passion and desire around the world. It stands for design that is instantly recognised yet continuously evolving. It promises and delivers innovative ideas with legendary levels of comfort and sporting, satisfying handling. It brings you the benefit of years of development through motor sport, with instant power that produces a sheer adrenaline thrill.

To own a Jaguar is to experience a unique spirit. To drive a Jaguar is an ambition fulfilled.

THE XJ RANGE

The Jaguar XJ presents a virtually unique combination of qualities: limousine standards of comfort with genuinely sporting performance and handling. Completely re-engineered, the most advanced production Jaguar is also more thrilling to drive than ever before.

Fundamental to this experience is an exceptionally strong and light all-new aluminium body that allows you to enjoy the full benefit of the powerful V6 and V8 engines. Industry-leading technology provides impressive levels of safety and easy, driver-friendly control, complemented by cosseting luxury and a shape with timeless beauty and presence.

XJ6

Sovereign

XJ SE

XJR

XJ Sport

Super V8

INTERIOR TRIM COMBINATIONS

CHAMPAGNE / MOCHA

DOVE / GRANITE
(Granite leatherette facia not available on Super V8)

Notes:
These images show standard wheelbase.
Ivory is a cost option.
Cranberry is only available with R Performance seats or soft grain leather pack (Super V8 seats).

IVORY / MOCHA

IVORY / WARM CHARCOAL

The following piping combinations for seat and door inserts are only available with soft grain leather pack.

CRANBERRY / WARM CHARCOAL

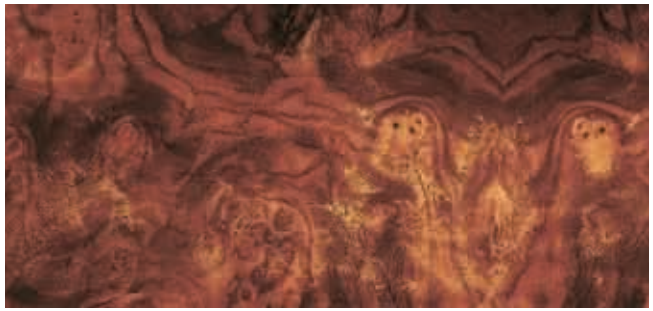
WARM CHARCOAL / WARM CHARCOAL

SEAT TRIM COLOUR	CONTRAST PIPING
Champagne	Mocha
Cranberry	Cranberry
Dove	Granite
Ivory	Mocha
Ivory	Warm Charcoal
Warm Charcoal	Warm Charcoal

The colours are intended to serve primarily as a guide and and will not be accurate due to the limitations of electronic media. Please ask your dealer to show you samples.

For full details of available colour and trim combinations and extra cost for upholstery materials (where applicable), please consult your dealer and current Price List.

VENEERS, STEERING WHEELS AND SEATS



BURR WALNUT VENEER
(standard fitment on all models)

GREY STAINED BIRDS EYE MAPLE VENEER
(optional on standard wheelbase models only)

BURR WALNUT WOOD/
LEATHER RIM COLOUR
KEYED

ALL BURR WALNUT
WOOD RIM

R PERFORMANCE
LEATHER RIM

COMFORT LEATHER SEAT

R PERFORMANCE LEATHER SEAT

Note:
Wood, wood/leather and heated steering wheels are not available with Grey stained Birds Eye Maple veneer

SUPER V8 SEAT WITH SOFT
GRAIN RUCHED LEATHER

TECHNICAL SPECIFICATIONS

	3.0 LITRE V6	3.5 LITRE V8	4.2 LITRE V8		4.2 LITRE V8 S/C	
			SWB	LWB	SWB (XJR)	LWB (Super V8)
ENGINE						
Cylinders/valves per cylinder	6/4	8/4	8/4		8/4	
Bore/stroke – mm	89.0/79.5	86.0/76.5	86.0/90.3		86.0/90.3	
Capacity – cc	2,967	3,555	4,196		4,196	
Maximum power – DIN bhp (kW)	240 (179)	262 (196)	300 (224)		400 (298)	
EEC PS (kW)	238 (175)	258 (190)	298 (219)		395 (291)	
@ rev/min	6,800	6,250	6,000		6,100	
Maximum torque – DIN lb.ft. (Nm)	221 (300)	254 (345)	310 (420)		408 (553)	
EEC lb.ft. (Nm)	216 (293)	247 (335)	303 (411)		399 (541)	
@ rev/min	4,100	4,200	4,100		3,500	
Compression ratio :1	10.5	11.0	11.0		9.1	
Transmission	6-speed automatic	6-speed automatic	6-speed automatic		6-speed automatic	
PERFORMANCE (MANUFACTURER'S ESTIMATES)						
Acceleration 0-60 mph (0-100 km/h) – sec	7.8 (8.1)	7.3 (7.6)	6.3 (6.6)		5.0 (5.3)	
Top speed – mph (km/h)	145 (233)	150 (242)	155 Limited (250)		155 Limited (250)	
FUEL CONSUMPTION (1)						
Urban – mpg (l/100km)	18.5 (15.3)	17.8 (15.9)	17.7 (16.0)		15.2 (18.6)	
Extra urban – mpg (l/100km)	36.7 (7.7)	36.7 (7.7)	34.9 (8.1)		31.4 (9.0)	
Combined – mpg (l/100km)	27.0 (10.5)	26.5 (10.7)	26.0 (10.9)		23.0 (12.3)	
Carbon dioxide emissions – g/km	249	254	264		299	
Tank capacity – gals (Ltr) approx. including reserve	18.7 (85) 5.8 ltr res.	18.7 (85) 5.8 ltr res.	18.7 (85) 5.8 ltr res.		18.7 (85) 7.5 ltr res.	
WEIGHT (2) / DIMENSIONS						
Kerb weight – lb (kg)	3,406 (1,545)	3,560 (1,615)	3,560 (1,615)	3,614 (1,639)	3,671 (1,665)	3,724 (1,689)
Gross vehicle weight – lb (kg)	4,784 (2,170)	4,850 (2,200)	4,850 (2,200)	4,963 (2,251)	4,960 (2,250)	5,036 (2,284)
Permitted roof load – lb (kg)	165 (75)	165 (75)	165 (75)	165 (75)	165 (75)	165 (75)
Permitted trailer load, unbraked – lb (kg)	1,650 (750)	1,650 (750)	1,650 (750)	1,650 (750)	1,650 (750)	1,650 (750)
Permitted trailer load, braked – lb (kg)	4,180 (1,900)	4,180 (1,900)	4,180 (1,900)	4,180 (1,900)	4,180 (1,900)	4,180 (1,900)
Permitted towbar download – lb (kg)	168 (76)	168 (76)	168 (76)	168 (76)	168 (76)	168 (76)
Turning circle – ft. in. (m)	38' 5" (11.7)	38' 5" (11.7)	38' 5" (11.7)	39' 6" (12.04)	38' 5" (11.7)	39' 6" (12.04)
Boot volume – cu. ft. (litres – VDA)	16.6 (470)	16.6 (470)	16.6 (470)	16.6 (470)	16.6 (470)	16.6 (470)

(1) The fuel consumption figures were obtained in tests carried out in line with the Passenger Car Fuel Consumption Amendment Order 1996 (Reflecting EU Directive 1999/100/EC fuel consumption test cycle). These figures were correct at the time of going to press.

(2) Please consult your dealer for details of changes associated with option fitment. Kerb weights reflect vehicles to standard specifications. Optional extras increase weight.

SWB - standard wheelbase

LWB - long wheelbase

WHEELS AND DIMENSIONS

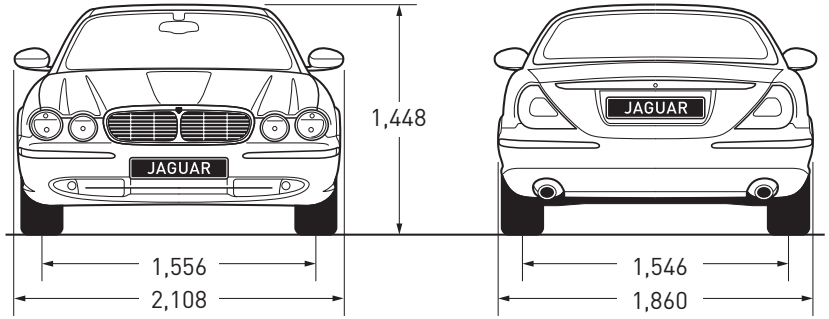
Dynamic 8" x 18"
235/50 ZR18

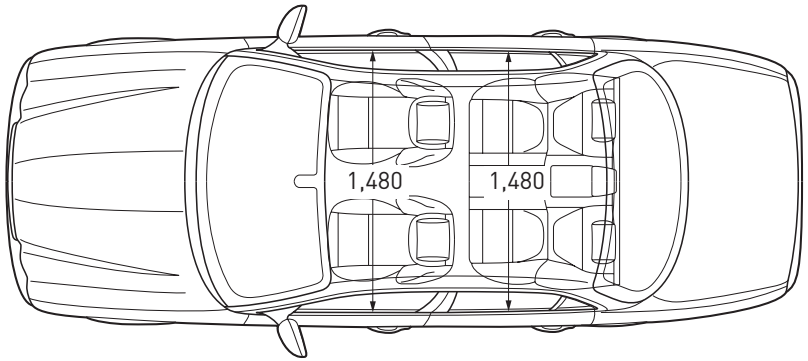
Luxury 8" x 18"
235/50 ZR18

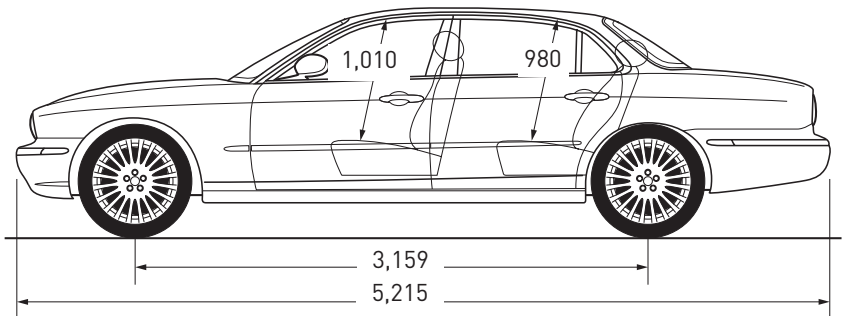
Custom 8.5" x 19"
255/40 ZR19

Performance 8.5" x 19"
255/40 ZR19

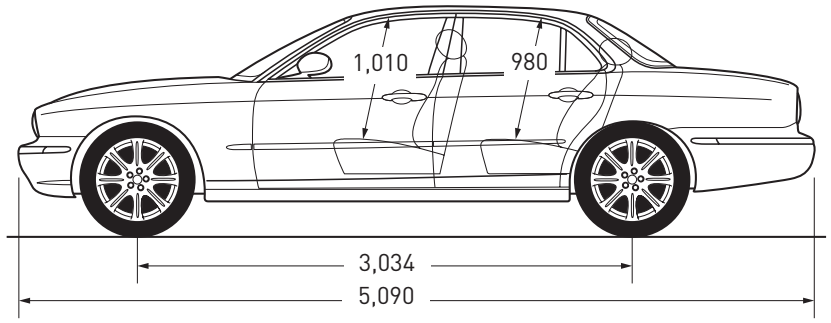
Sepang 9" x 20"
255/35 ZR20







Long wheelbase.



Standard wheelbase.

STANDARD AND OPTIONAL EQUIPMENT

		XJ6 3.0 V6	Sport 3.5 V8	Sport Premium 3.5 V8	SE 3.0 V6, 4.2 V8	Sovereign 3.0 V6, 4.2 V8	Sovereign 4.2 V8 LWB	XJR 4.2 V8 S/C	Super V8 4.2 V8 S/C LWB	List £	VAT £	Retail £
TRANSMISSION/SUSPENSION/BRAKES												
Air suspension	- CATS (Computer Active Technology Suspension)	■	■	■	■	■	■	■	■	-	-	-
	- Sports **C31A**	○	■	■	○	○	□	■	□	425.53	74.47	500.00
	- Standard	■	□	□	■	■	■	□	■	-	-	-
Brakes	- Brembo, four piston silver colour callipers	□	□	□	□	□	□	■	■	-	-	-
	- Electronic Park Brake (EPB)	■	■	■	■	■	■	■	■	-	-	-
	- Vented discs front and rear	■	■	■	■	■	■	■	■	-	-	-
Drivetrain control	- Dynamic Stability Control (DSC)	■	■	■	■	■	■	■	■	-	-	-
	- Traction control	■	■	■	■	■	■	■	■	-	-	-
Transmission	- 6-speed electronic automatic	■	■	■	■	■	■	■	■	-	-	-
Wheelbase	- Long	□	□	□	□	□	■	□	■	-	-	-
	- Standard	■	■	■	■	■	□	■	□	-	-	-
EXTERIOR FEATURES												
De-chrome exterior pack	- Body colour rear signature blade and grille surround with Black mesh grille and window surrounds (bright mesh grille on XJR) **Z14L**	○	■	■	○	○	□	■	□	382.98	67.02	450.00
Exterior mirrors with ground illumination	- Power adjustable, heated	■	■	□	□	□	□	□	□	-	-	-
	- Power foldback, heated and electrochromic **H42F**	○	○	■	■	■	■	■	■	238.30	41.70	280.00
Front fog lights		■	■	■	■	■	■	■	■	-	-	-
Garage Door Opener (Operating frequency 0mhz to 433mhz) **B20B**		□	○	○	○	○	○	○	■	255.32	44.68	300.00
Headlights	- Automatic headlights	■	■	■	■	■	■	■	■	-	-	-
	- Halogen headlights	■	■	□	■	■	■	□	□	-	-	-
	- Headlight powerwash **D17C**	○	○	■	■	■	■	■	■	212.77	37.23	250.00
	- Bi-xenon headlights (1) **D90H**	(○)	(○)	■	○	■	■	■	■	391.49	68.51	460.00
Heated front windscreen with timer **D96A**		○	○	■	■	■	■	■	■	208.51	36.49	245.00
Heated rear window with timer		■	■	■	■	■	■	■	■	-	-	-
Metallic paint **X19B**		○	■	■	■	■	■	■	■	638.30	111.70	750.00
Parking assist	- Front	○	○	■	■	■	■	■	■	212.77	37.23	250.00
	- Rear	■	■	■	■	■	■	■	■	-	-	-
Rain sensing windscreen wipers		■	■	■	■	■	■	■	■	-	-	-
Spare wheel	- Full size (2) **C40A**	○	○	○	○	○	○	○	○	106.38	18.62	125.00
	- Space saver	■	■	■	■	■	■	■	■	-	-	-
Sunroof	- Glass, electric tilt/slide with one-touch operation **F47G**	○	○	○	○	○	○	○	○	931.91	163.09	1,095.00
Wheels	- Custom 8.5" x 19" cast alloy **C48H**	○	○	■	○	■	■	□	■	851.06	148.94	1,000.00
		□	□	□	□	□	□	○	□	425.53	74.47	500.00
	- Dynamic 8" x 18" cast alloy **C48B**	○	■	□	■	□	□	□	□	425.53	74.47	500.00
	- Luxury 8" x 18" cast alloy **C48G**	■	□	□	○	□	□	□	□	425.53	74.47	500.00
	- Performance 8.5" x 19" cast alloy	□	□	□	□	□	□	■	□	-	-	-
R Performance Wheel	- Sepang 9" x 20" split-rim cast alloy **C48F**	○	○	□	○	○	○	□	○	2,127.66	372.34	2,500.00
		□	□	○	□	□	□	○	□	1,702.13	297.87	2,000.00

■ Standard ○ Optional at extra cost △ Optional at no extra cost □ Not available (○) Linked option

(1) Requires headlight powerwash.
(2) Only available with 18" and 19" wheels. (Sepang 20" wheel always has space saver spare).

LWB - long wheelbase

STANDARD AND OPTIONAL EQUIPMENT

INTERIOR THEME, TRIM AND SEATING		XJ6 3.0 V6	Sport 3.5 V8	Sport Premium 3.5 V8	SE 3.0 V6, 4.2 V8	Sovereign 3.0 V6, 4.2 V8	Sovereign 4.2 V8 LWB	XJR 4.2 V8 S/C	Super V8 4.2 V8 S/C LWB	List £	VAT £	Retail £
Gearknobs	- Leather with chrome sides	■	■	■	□	□	□	□	□	-	-	-
	- R Performance leather with chrome sides	□	□	□	□	□	□	■	□	-	-	-
	- Wooden (Burr Walnut only)	□	□	□	■	■	■	□	■	-	-	-
Seats, front	- Comfort leather seats	■	□	□	■	■	■	□	□	-	-	-
	- Comfort leather seats - as standard seats, plus electric adjustment to cushion length and vertical lumbar for driver's and passenger's seat (3) **Z43K**	(○)	□	□	○	■	■	□	■	425.53	74.47	500.00
	- Driver's and passenger's electric adjustment	■	■	■	■	■	■	■	■	-	-	-
	- Memory pack - Memory function with 3 settings for driver's seat, exterior mirrors, steering column and adjustable foot pedals **H44M**	○	■	■	■	■	■	■	■	595.74	104.26	700.00
	- R Performance leather seats - as standard seats, plus electric adjustment to cushion length and vertical lumbar for driver's seat (3) **Z59A**	□	■	■	□	□	□	■	□	-	-	-
	- Variable temperature heated - cushion and squab **B47C**	○	○	■	■	■	■	■	■	280.85	49.15	330.00
Seats, rear	- Business trays (4) **G73C ***	□	□	□	□	□	○	□	○	638.30	111.70	750.00
	- Electric heated bench with individual electric seat back, head restraints and lumbar adjustments and memory (5) **H48D**	□	□	□	(○)	(○)	(○)	□	■	1,659.57	290.43	1,950.00
	- Fixed bench	■	■	■	■	■	■	■	□	-	-	-
	- Twin electric heated seat with centre console, individual electric seat back adjustment, head restraints, lumbar support and front passenger seat adjustment from rear (6) **Z48E***	□	□	□	(○)	(○)	(○)	□	△	1,659.57	290.43	1,950.00
	- Variable temperature heated - cushion and squab **B47C**	○	○	○	■	■	■	○	■	280.85	49.15	330.00
Seats, upholstery	- Ivory leather **X26B**	○	○	○	○	○	○	○	○	638.30	111.70	750.00
Soft grain leather pack	- Soft grain Super V8 ruched leather seats and door panel (7) **ZPJD**	□	□	□	(○)	■	■	(○)	■	510.64	89.36	600.00
Steering wheels	- Heated wood/leather rim, 4 spoke (Burr Walnut only) (8) **F95D**	(○)	(○)	□	□	□	□	○	□	472.34	82.66	555.00
		□	□	○	○	○	○	□	□	200.00	35.00	235.00
									△	Optional at no extra cost		
	- Heated all wood rim, 4 spoke (Burr Walnut only) (8) **F95E**	(○)	(○)	□	□	□	□	○	■	659.57	115.43	775.00
		□	□	○	○	○	○	□	□	387.23	67.77	455.00
	- R Performance leather rim, 4 spoke	■	■	■	□	□	□	■	□	-	-	-
	- Wood/leather rim, 4 spoke (Burr Walnut only) **F95W**	○	○	○	■	■	■	○	□	272.34	47.66	320.00
Veneers	- Burr Walnut	■	■	■	■	■	■	■	■	-	-	-
	- Grey stained Birds Eye Maple (9)	△	△	△	□	□	□	△	□	-	-	-

■ Standard ○ Optional at extra cost △ Optional at no extra cost □ Not available (○) Linked option

(3) Only available with memory pack.
(4) Only available with soft grain leather pack and Burr Walnut veneer.
(5) Only available with comfort seats, Jaguar Alpine Premium Sound System and rear multimedia controls.
(6) Only available with soft grain leather pack, Jaguar Alpine Premium Sound System, rear multimedia controls and Burr Walnut veneer.
(7) Only available with variable heated front and rear seats.
(8) Only available with variable heated front seats.
(9) Only available with R Performance leather 4 spoke steering wheel, leather gearknob with chrome sides and dual-zone air conditioning.

LWB - long wheelbase

Please see pages 14-17 to view the full colour and trim guide.

* Subject to availability. (Please consult your dealer)

STANDARD AND OPTIONAL EQUIPMENT

INTERIOR FEATURES		XJ6 3.0 V6	Sport 3.5 V8	Sport Premium 3.5 V8	SE 3.0 V6, 4.2 V8	Sovereign 3.0 V6, 4.2 V8	Sovereign 4.2 V8 LWB	XJR 4.2 V8 S/C	Super V8 4.2 V8 S/C LWB	List £	VAT £	Retail £
Analogue clock		■	■	■	■	■	■	■	■	-	-	-
Climate control	- Automatic climate control with air filtration and dual zone control for driver and front passenger	■	■	■	■	■	■	■	■	-	-	-
	- 4-zone automatic climate control (not available with Grey stained Birds Eye Maple) **C88G**	□	○	○	○	○	○	○	○	893.62	156.38	1,050.00
Cruise control	- Adaptive Cruise Control (ACC) **H41D**	○	○	○	○	○	○	○	■	1,106.38	193.62	1,300.00
	- With multi-function steering wheel controls for audio and (where fitted) telephone and voice control	■	■	■	■	■	■	■	■	-	-	-
Cup holders	- Twin, front	△	△	△	■	■	■	■	■			
	- Twin, rear	■	■	■	■	■	■	■	■	-	-	-
Electric windows	- Front and rear with one-touch open/close	■	■	■	■	■	■	■	■	-	-	-
Electrochromic rear view mirror		■	■	■	■	■	■	■	■	-	-	-
Electrochromic rear view mirror with integrated compass **B27A**		○	○	○	○	○	○	○	○	68.09	11.91	80.00
Footwell mats	- Carpet	■	■	■	■	■	■	■	■	-	-	-
	- Lambswool rugs **H69C**	○	○	○	○	○	○	○	○	242.55	42.45	285.00
Foot pedals	- Electric adjustment	■	■	■	■	■	■	■	■	-	-	-
Interior mood lighting		■	■	■	■	■	■	■	■	-	-	-
Power assisted steering	- Variable ratio speed sensitive	■	■	■	■	■	■	■	■	-	-	-
Rear cigar lighter		■	■	■	■	■	■	■	■	-	-	-
Ski hatch with bag (10) **B46A**		○	○	○	○	○	○	○	□	255.32	44.68	300.00
Steering column	- Electric adjustment for reach and rake, with entry and exit tilt-away	■	■	■	■	■	■	■	■	-	-	-
Sunblind	- Side rear window, manual **H73B**	○	○	○	○	○	○	○	○	157.45	27.55	185.00
	- Rear, electric **H76G**	○	○	○	○	■	■	■	■	195.74	34.26	230.00
Sunvisors	- Driver's and passenger's with covered and illuminated vanity mirror	■	■	■	■	■	■	■	■	-	-	-
Trip Computer	- With dual function	■	■	■	■	■	■	■	■	-	-	-
AUDIO/COMMUNICATIONS												
Audio equipment	- Jaguar Sound System with cassette/AM/FM radio featuring EON, RDS, PTY, TA, automatic volume control and 8 speakers	△	■	■	□	□	□	□	□	-	-	-
	- Jaguar Alpine Premium Sound System with cassette/AM/FM radio featuring DSP, 320 watt output amplifier, subwoofers and 12 speakers **B49B**	○	○	○	■	■	■	■	■	697.87	122.13	820.00
	- CD autochanger (boot mounted 6 disc capacity)	○	■	■	■	■	■	■	■	302.13	52.87	355.00
	- Single slot CD/radio (in lieu of cassette/radio)	■	△	△	△	△	△	△	△			
	- Mini Disc/radio (in lieu of cassette/radio) **B44C**	○	○	○	○	○	○	○	○	157.45	27.55	185.00
JaguarVoice	- Front, voice control of audio, automatic climate control and (where fitted) telephone, navigation and TV with teletext **P52A**	○	○	○	○	■	■	○	■	374.47	65.53	440.00
	- Rear, voice control of audio, automatic climate control and (where fitted) telephone with conference call facility (11) **P53A**	(○)	(○)	(○)	(○)	(○)	(○)	(○)	(○)	Optional at no extra cost 182.98	32.02	215.00
Multimedia system	- Navigation system with DVD mapping, postcode entry and voice guidance, including 7" touch-screen incorporating controls for audio, climate control and (where fitted) telephone (12) **Z57L**	○	○	○	○	■	■	■	■	1,702.13	297.87	2,000.00
	- TV tuner for touch screen (13) **G52A**	○	○	○	○	○	○	○	○	425.53	74.47	500.00
	- Rear multimedia controls (14) **P51A**	(○)	(○)	(○)	○	○	○	○	■	297.87	52.13	350.00
	- Twin rear 6.5" LCD screens (mounted in rear of front head restraints) with inputs for your own audio visual source and connections to (where fitted) DVD player and television tuner (15) **Z54E**	(○)	(○)	(○)	(○)	(○)	(○)	(○)	○	1,608.51	281.49	1,890.00
	- DVD player for rear display screens **G54E**	(○)	(○)	(○)	(○)	(○)	(○)	(○)	○	561.70	98.30	660.00
Telephone system	- Fixed dual band integrated with keypad **H74R**	○	○	○	○	■	■	○	■	672.34	117.66	790.00

■ Standard ○ Optional at extra cost △ Optional at no extra cost □ Not available (○) Linked option

LWB - long wheelbase. Please see next page for notes

STANDARD AND OPTIONAL EQUIPMENT

SAFETY		XJ6 3.0 V6	Sport 3.5 V8 3.5 V8	Sport Premium 4.2 V8	SE 3.0 V6, 4.2 V8	Sovereign 3.0 V6, 4.2 V8 LWB		XJR 4.2 V8 S/C	Super V8 4.2 V8 S/C LWB	List £	VAT £	Retail £
Adaptive Restraint Technology System (A.R.T.S.)		■	■	■	■	■	■	■	■	-	-	-
Airbags	- Front and side for driver and front passenger	■	■	■	■	■	■	■	■	-	-	-
	- Side curtain	■	■	■	■	■	■	■	■	-	-	-
Anti-lock Braking System (ABS)		■	■	■	■	■	■	■	■	-	-	-
Emergency Brake Assist (EBA)		■	■	■	■	■	■	■	■	-	-	-
Energy absorbent seating system		■	■	■	■	■	■	■	■	-	-	-
First aid kit **C12A**		○	○	○	○	○	○	○	○	29.79	5.21	35.00
High-level rear stop light		■	■	■	■	■	■	■	■	-	-	-
Seatbelts	- Pre-tensioners, front and rear	■	■	■	■	■	■	■	■	-	-	-
	- Belt minder	■	■	■	■	■	■	■	■	-	-	-
	- Rear child seat Isofix anchors	■	■	■	■	■	■	■	■	-	-	-
Warning triangle **F29A**		○	○	○	○	○	○	○	○	25.53	4.47	30.00
SECURITY												
Security	- Security system with remote central locking (2-stage unlock), deadlocking, driveaway locking, glass breakage ultrasonic intrusion sensing, vehicle immobiliser (Thatcham 1 approved) and passive sounder with battery back up	■	■	■	■	■	■	■	■	-	-	-

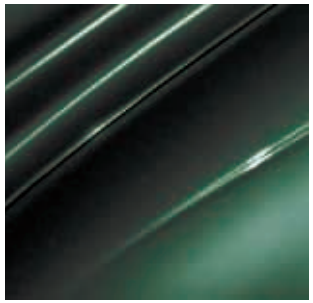
■ Standard ○ Optional at extra cost △ Optional at no extra cost □ Not available (○) Linked option

(10) Not available with electric heated bench or console rear seats.
(11) Only available with front voice control, Jaguar Alpine Premium Sound System and rear multimedia controls.
(12) Country mapping DVD covers:
Austria, Belgium, Denmark, Finland*, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway*, Portugal*, Spain* Sweden (South), Switzerland and the United Kingdom.
* Limited coverage
(13) Only available with Navigation, touch-screen.
(14) Only available with Jaguar Alpine Premium Sound System.
(15) Only available with Jaguar Alpine Premium Sound System, rear multimedia controls and Comfort or R Performance seats (recommended with rear sunblinds).

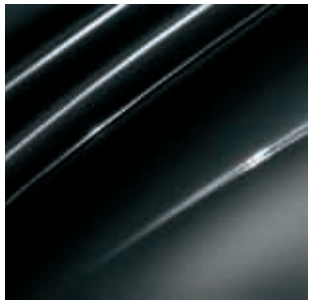
LWB - long wheelbase

For feature availability, please contact your dealer for details.

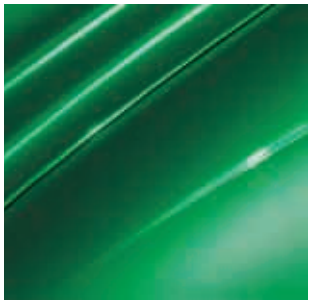
EXTERIORS COLOURS



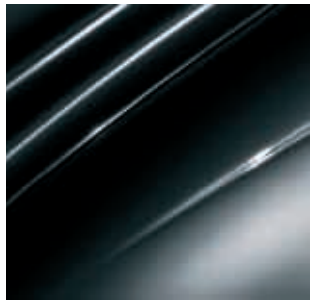
British Racing Green



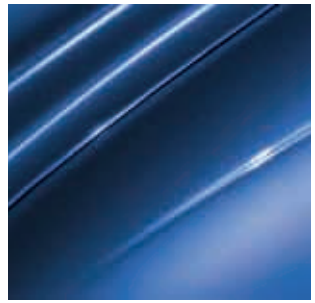
Ebony



Jaguar Racing Green*



Midnight*



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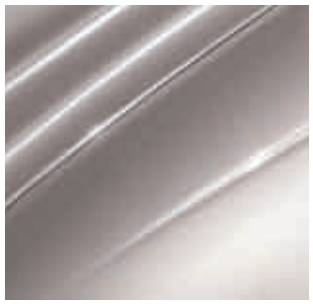

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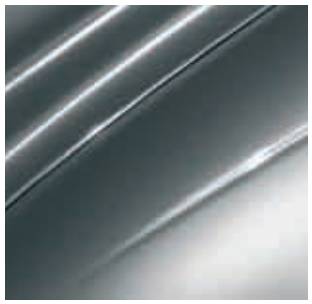
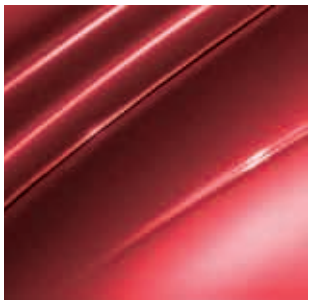


Quartz*



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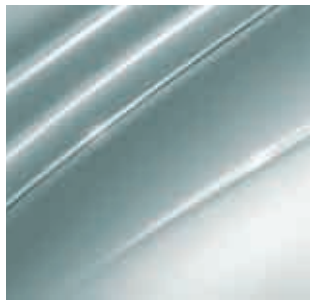

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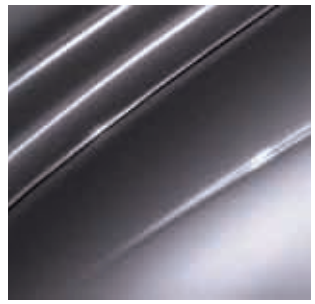
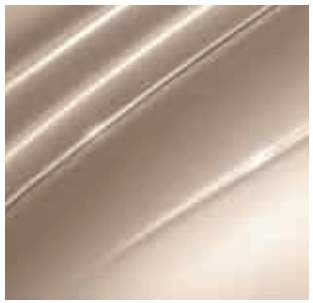


Slate*



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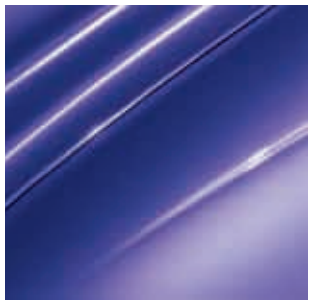

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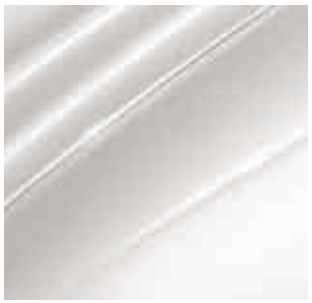
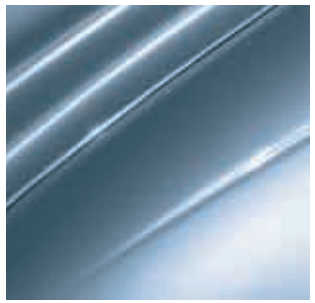


White Onyx



Zircon*

The colours are intended to serve primarily as a guide and and will not be accurate due to the limitations of electronic media. Please ask your dealer to show you samples.

* Metallic paint is optional on the XJ6.

JAGUAR

XJ

PRICES	LIST	VAT	RETAIL	P11D	OTR
XJ6 3.0 litre V6	£33,405.96	£5,846.04	£39,252	£39,772	£39,970
XJ6 3.0 litre V6 SE	£36,895.32	£6,456.68	£43,352	£43,872	£44,070
XJ6 3.0 litre V6 Sovereign	£40,980.43	£7,171.57	£48,152	£48,672	£48,870
XJ8 3.5 litre V8 Sport	£38,129.36	£6,672.64	£44,802	£45,322	£45,520
XJ8 3.5 litre V8 Sport Premium	£40,257.02	£7,044.98	£47,302	£47,822	£48,020
XJ8 4.2 litre V8 SE	£45,193.19	£7,908.81	£53,102	£53,622	£53,820
XJ8 4.2 litre V8 Sovereign	£49,278.30	£8,623.70	£57,902	£58,422	£58,620
XJ8 4.2 litre V8 Sovereign (LWB)	£50,767.66	£8,884.34	£59,652	£60,172	£60,370
XJR 4.2 litre V8 Supercharged	£51,278.30	£8,973.70	£60,252	£60,772	£60,970
Super V8 4.2 litre V8 Supercharged (LWB)	£60,640.00	£10,612.00	£71,252	£71,772	£71,970

(LWB) - long wheelbase

PRICE AND SPECIFICATION

All prices are based on manufacturer's recommended prices. List Prices apply throughout Great Britain, Northern Ireland, the Channel Islands and the Isle of Man. "On the road prices" are included for the benefit of purchasers in Great Britain and Northern Ireland only and are calculated using Retail Prices from this price list and adding 12 months Vehicle Excise Duty, delivery to the Jaguar Dealer premises, first registration fee and an estimated price for number plates and a full tank of fuel. P11D price represents the taxable amount company car drivers will pay tax on. P11D price is calculated using the On The Road price and deducting the government levied charges: first registration fee* (£38) and Road Fund Licence* - amount varies in accordance with the vehicle fuel type and CO_2 emissions (see table shown). Prices and specifications are subject to change without notice. Factory fitted options indicated on the original order will be supplied at extra cost. The prices are applicable to vehicles sold for permanent use in the UK.

Band	CO_2 Emissions	Petrol Engines (£)	Diesel Engines (£)
AA	up to 120 g/km	75	85
A	121-150 g/km	105	115
B	151-165 g/km	125	135
C	166-185 g/km	145	155
D	over 185 g/km	160	165
*First registration fee and road fund licence subject to statutory changes			

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH II
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY

BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH
THE QUEEN MOTHER
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY

BY APPOINTMENT TO
HIS ROYAL HIGHNESS THE PRINCE OF WALES
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY

IMPORTANT NOTICE

Jaguar Cars Limited is constantly seeking ways to improve the specification, design and production of its vehicles and alterations take place continually. Whilst every effort is made to produce up-to-date literature, this brochure should not be regarded as an infallible guide to current specifications, nor does it constitute an offer for the sale of any particular vehicle. Distributors and dealers are not agents of Jaguar Cars Limited by any express or implied undertaking or representation.

ENVIRONMENTAL NOTICE

Jaguar Cars Limited has a vision of being amongst the world's leading companies in demonstrating progress towards sustainability. We aim to do this by contributing to a better quality of life for communities affected by the design, manufacture, use and disposal of Jaguar cars. We believe that playing a supportive role in the communities in which we operate is a privilege, not an obligation. Corporate citizenship goes to the very heart of our company.

It is Jaguar's policy continually to improve its high environmental standards in all areas of business activity.

Jaguar Cars Limited
Browns Lane Allesley
Coventry CV5 9DR

WWW.JAGUAR.CO.UK

JAGUAR	XJ range	DATE 04/04	XJ501-R719

SERVICE **TECHNICAL BULLETIN**

Passenger Air Bag Door – Trim Rough Edges Of Opening – Recall R719

MODEL	2004 MY XJ range
VIN	Refer to VIN list

Issue:

A concern has been identified on a small number of 2004 MY XJ vehicles within the above VIN range. A poor cutting process during the manufacture of the air bag instrument panel opening may have resulted in a rough finish of the passenger air bag instrument panel opening edge. If the passenger air bag were to deploy there is a possibility that the air bag could be torn.

Only those vehicles listed in this bulletin by VIN need to be inspected and, if necessary, reworked.

Jaguar will be contacting customers with a letter which is included in this bulletin for reference.

Action:

Refer to the VIN list included in this bulletin to determine which vehicles are affected by this Recall.

Inspect the passenger air bag opening and, if necessary, remove any sharp serrated edges.

All unsold vehicles or vehicles that have not been handed over to the customer must be inspected and, if necessary, repaired prior to sale or onward distribution.

RECALL

NOTE: THE INFORMATION IN TECHNICAL BULLETINS IS INTENDED FOR USE BY TRAINED, PROFESSIONAL TECHNICIANS WITH THE KNOWLEDGE, TOOLS, AND EQUIPMENT TO DO THE JOB PROPERLY AND SAFELY. IT INFORMS THESE TECHNICIANS OF CONDITIONS THAT MAY OCCUR ON SOME VEHICLES, OR PROVIDES INFORMATION THAT COULD ASSIST IN PROPER VEHICLE SERVICE. THE PROCEDURES SHOULD NOT BE PERFORMED BY "DO-IT-YOURSELFERS." DO NOT ASSUME THAT A CONDITION DESCRIBED AFFECTS YOUR CAR. CONTACT A JAGUAR RETAILER TO DETERMINE WHETHER THE BULLETIN APPLIES TO YOUR VEHICLE.

WORKSHOP PROCEDURE

1. Open door, open luggage compartment.
2. Disconnect the battery, see Workshop Manual, section: 414-01.

> ⚠ **Warning:** Wait one minute after disconnecting battery to allow the air bag system to deactivate.

3. Use a nonmetallic tool to displace and reposition the passenger air bag deployment door to avoid damage.
4. Place a suitable clean cloth over the passenger air bag and deployment door (Illustration 1).

POTENTIAL LOCATION OF SERRATED EDGES ON UPPER EDGE (RHD VEHICLE SHOWN)

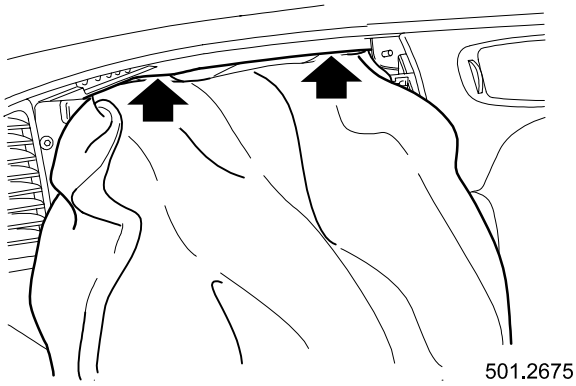


ILLUSTRATION 1

5. Inspect the passenger instrument panel air bag aperture for sharp serrated edges. If sharp serrated edges are evident, proceed to step 7 of this workshop procedure. If no sharp serrated edges are evident proceed to step 13 of this workshop procedure.

> ⚠ **Caution:** Use care not to cause damage to the instrument panel while filing smooth the serrated sharp edges of the air bag aperture.

6. Using a suitable file, remove any sharp serrated edges from the top edge of the aperture (Illustration 1).
7. Remove the cloth and reposition the air bag deployment door upwards and hold in position.
8. Place a suitable clean cloth behind the lower edge of the passenger air bag aperture.

> ⚠ **Caution:** Use care not to cause damage to the instrument panel while filing smooth the serrated sharp edges of the air bag aperture.

9. Using a suitable file, remove any sharp serrated edges from the aperture lower edge (Illustration 2).

POTENTIAL LOCATION OF SERRATED EDGES ON LOWER EDGE (RHD VEHICLE SHOWN)

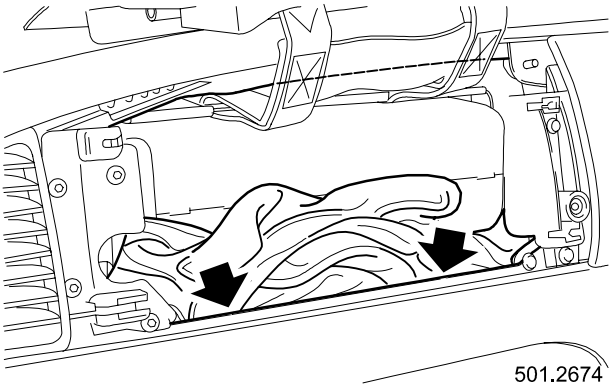


ILLUSTRATION 2

10. Remove the cloth from the vehicle.
11. Using a suitable vacuum cleaner, remove any remaining debris from the vehicle.
12. Align and fully seat the passenger air bag deployment door.
13. Reconnect the battery, see Workshop Manual, section: 414-01. Reset customer preferences.
14. Remove fender protection kit.
15. Close luggage compartment and door.

Global Technical Reference (GTR):

Dealer Access: https://hub.franchise.jaguar.com

Internet access: http://www.jaguartechinfo.com

Warranty Information:

Warranty claims should be submitted quoting program code R719 together with the relevant option code from the table below.

This will result in payment of the stated time and, where applicable the relevant parts/ miscellaneous expense codes.

The options that allow for drive in/drive out can only be claimed when the vehicle has been brought into the workshop for this action alone to be undertaken.

The SROs and parts listed above have been included for information only. There will be no requirement to enter the parts or SROs onto the claim.

Service Action R719

Model	VIN Range
2004 MY XJ Range	**4S**G25690 - **4S**G27957
2004 MY XJR	**4T**G25690 - **4T**G27957

Refer to specific VIN list starting on following page.

Program Code	Option	Description	SRO	Time	Part Number	Part Description	Qty
R719	B	Inspect aperture edge finish and if necessary rework	76.94.46	0.2 hrs.	-	-	-
R719	C	Inspect aperture edge finish and if necessary rework	76.94.46	0.2 hrs.	-	-	-
		Drive in/drive out	10.10.10	0.1 hrs.			

NOTE: Always perform a DDW claim search first to determine whether this service action has been performed on this vehicle. The “Review Claim History” function will provide a listing of all claims against the vehicle. If this service action number appears in the program code field, do not perform this service action.

USA VIN LIST

Chassis No.	Full VIN
G25764	SAJWA71C04SG25764
G25778	SAJWA71C04SG25778
G25781	SAJWA71C04SG25781
G25912	SAJWA71C04SG25912
G25926	SAJWA71C04SG25926
G25957	SAJWA71C04SG25957
G25974	SAJWA71C04SG25974
G25991	SAJWA71C04SG25991
G26025	SAJWA71C04SG26025
G26042	SAJWA71C04SG26042
G26073	SAJWA71C04SG26073
G26106	SAJWA71C04SG26106
G26123	SAJWA71C04SG26123
G26140	SAJWA71C04SG26140
G26218	SAJWA71C04SG26218
G26221	SAJWA71C04SG26221
G26252	SAJWA71C04SG26252
G26297	SAJWA71C04SG26297
G26333	SAJWA71C04SG26333
G26347	SAJWA71C04SG26347
G26395	SAJWA71C04SG26395
G26428	SAJWA71C04SG26428
G26512	SAJWA71C04SG26512
G26526	SAJWA71C04SG26526
G26607	SAJWA71C04SG26607
G26641	SAJWA71C04SG26641
G26655	SAJWA71C04SG26655
G26736	SAJWA71C04SG26736
G26767	SAJWA71C04SG26767
G26851	SAJWA71C04SG26851
G26865	SAJWA71C04SG26865
G26915	SAJWA71C04SG26915
G27255	SAJWA71C04SG27255
G27269	SAJWA71C04SG27269
G27367	SAJWA71C04SG27367
G27479	SAJWA71C04SG27479
G27675	SAJWA71C04SG27675
G27739	SAJWA71C04SG27739
G27921	SAJWA71C04SG27921
G27952	SAJWA71C04SG27952
G25790	SAJWA71C14SG25790
G25868	SAJWA71C14SG25868
G25871	SAJWA71C14SG25871
G25918	SAJWA71C14SG25918
G25935	SAJWA71C14SG25935
G25983	SAJWA71C14SG25983
G25997	SAJWA71C14SG25997
G26017	SAJWA71C14SG26017
G26034	SAJWA71C14SG26034
G26079	SAJWA71C14SG26079
G26082	SAJWA71C14SG26082
G26101	SAJWA71C14SG26101
G26115	SAJWA71C14SG26115
G26129	SAJWA71C14SG26129

Chassis No.	Full VIN
G26146	SAJWA71C14SG26146
G26163	SAJWA71C14SG26163
G26177	SAJWA71C14SG26177
G26339	SAJWA71C14SG26339
G26342	SAJWA71C14SG26342
G26633	SAJWA71C14SG26633
G26681	SAJWA71C14SG26681
G26762	SAJWA71C14SG26762
G26857	SAJWA71C14SG26857
G26941	SAJWA71C14SG26941
G27085	SAJWA71C14SG27085
G27099	SAJWA71C14SG27099
G27247	SAJWA71C14SG27247
G27295	SAJWA71C14SG27295
G27359	SAJWA71C14SG27359
G27443	SAJWA71C14SG27443
G27491	SAJWA71C14SG27491
G27541	SAJWA71C14SG27541
G27619	SAJWA71C14SG27619
G27667	SAJWA71C14SG27667
G27717	SAJWA71C14SG27717
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G26138	SAJWA71C24SG26138
G26141	SAJWA71C24SG26141
G26155	SAJWA71C24SG26155
G26317	SAJWA71C24SG26317
G26379	SAJWA71C24SG26379
G26382	SAJWA71C24SG26382
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G26639	SAJWA71C24SG26639
G26771	SAJWA71C24SG26771
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G26883	SAJWA71C24SG26883
G27077	SAJWA71C24SG27077
G27239	SAJWA71C24SG27239
G27385	SAJWA71C24SG27385
G27435	SAJWA71C24SG27435
G27483	SAJWA71C24SG27483
G27497	SAJWA71C24SG27497
G27807	SAJWA71C24SG27807
G27855	SAJWA71C24SG27855
G27886	SAJWA71C24SG27886
G27936	SAJWA71C24SG27936
G25807	SAJWA71C34SG25807
G25838	SAJWA71C34SG25838

Chassis No.	Full VIN	Chassis No.	Full VIN
G25841	SAJWA71C34SG25841	G26464	SAJWA71C44SG26464
G25869	SAJWA71C34SG25869	G26500	SAJWA71C44SG26500
G25872	SAJWA71C34SG25872	G26724	SAJWA71C44SG26724
G25905	SAJWA71C34SG25905	G26819	SAJWA71C44SG26819
G25919	SAJWA71C34SG25919	G26884	SAJWA71C44SG26884
G25922	SAJWA71C34SG25922	G26917	SAJWA71C44SG26917
G25936	SAJWA71C34SG25936	G27159	SAJWA71C44SG27159
G25953	SAJWA71C34SG25953	G27243	SAJWA71C44SG27243
G26004	SAJWA71C34SG26004	G27307	SAJWA71C44SG27307
G26021	SAJWA71C34SG26021	G27467	SAJWA71C44SG27467
G26102	SAJWA71C34SG26102	G27565	SAJWA71C44SG27565
G26116	SAJWA71C34SG26116	G27615	SAJWA71C44SG27615
G26133	SAJWA71C34SG26133	G27680	SAJWA71C44SG27680
G26147	SAJWA71C34SG26147	G27727	SAJWA71C44SG27727
G26150	SAJWA71C34SG26150	G27842	SAJWA71C44SG27842
G26164	SAJWA71C34SG26164	G27890	SAJWA71C44SG27890
G26200	SAJWA71C34SG26200	G25730	SAJWA71C54SG25730
G26259	SAJWA71C34SG26259	G25923	SAJWA71C54SG25923
G26276	SAJWA71C34SG26276	G25954	SAJWA71C54SG25954
G26293	SAJWA71C34SG26293	G25985	SAJWA71C54SG25985
G26326	SAJWA71C34SG26326	G26019	SAJWA71C54SG26019
G26388	SAJWA71C34SG26388	G26022	SAJWA71C54SG26022
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G26410	SAJWA71C34SG26410	G26067	SAJWA71C54SG26067
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G26665	SAJWA71C34SG26665	G26215	SAJWA71C54SG26215
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G27251	SAJWA71C34SG27251	G26330	SAJWA71C54SG26330
G27279	SAJWA71C34SG27279	G26344	SAJWA71C54SG26344
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G27587	SAJWA71C34SG27587	G26456	SAJWA71C54SG26456
G27623	SAJWA71C34SG27623	G26571	SAJWA71C54SG26571
G27847	SAJWA71C34SG27847	G26649	SAJWA71C54SG26649
G27864	SAJWA71C34SG27864	G26781	SAJWA71C54SG26781
G25752	SAJWA71C44SG25752	G26893	SAJWA71C54SG26893
G25766	SAJWA71C44SG25766	G27039	SAJWA71C54SG27039
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G25850	SAJWA71C44SG25850	G27381	SAJWA71C54SG27381
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G26030	SAJWA71C44SG26030	G27882	SAJWA71C54SG27882
G26058	SAJWA71C44SG26058	G27932	SAJWA71C54SG27932
G26061	SAJWA71C44SG26061	G25770	SAJWA71C64SG25770
G26089	SAJWA71C44SG26089	G25834	SAJWA71C64SG25834
G26092	SAJWA71C44SG26092	G25901	SAJWA71C64SG25901
G26173	SAJWA71C44SG26173	G25915	SAJWA71C64SG25915
G26206	SAJWA71C44SG26206	G25932	SAJWA71C64SG25932
G26223	SAJWA71C44SG26223	G25963	SAJWA71C64SG25963
G26237	SAJWA71C44SG26237	G25977	SAJWA71C64SG25977
G26254	SAJWA71C44SG26254	G25980	SAJWA71C64SG25980
G26285	SAJWA71C44SG26285	G26000	SAJWA71C64SG26000
G26450	SAJWA71C44SG26450	G26014	SAJWA71C64SG26014

Chassis No.	Full VIN
G26028	SAJWA71C64SG26028
G26045	SAJWA71C64SG26045
G26076	SAJWA71C64SG26076
G26109	SAJWA71C64SG26109
G26112	SAJWA71C64SG26112
G26126	SAJWA71C64SG26126
G26191	SAJWA71C64SG26191
G26238	SAJWA71C64SG26238
G26241	SAJWA71C64SG26241
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G26367	SAJWA71C64SG26367
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G26434	SAJWA71C64SG26434
G26627	SAJWA71C64SG26627
G26689	SAJWA71C64SG26689
G26756	SAJWA71C64SG26756
G26787	SAJWA71C64SG26787
G26868	SAJWA71C64SG26868
G26885	SAJWA71C64SG26885
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G27387	SAJWA71C64SG27387
G27471	SAJWA71C64SG27471
G27521	SAJWA71C64SG27521
G27535	SAJWA71C64SG27535
G27812	SAJWA71C64SG27812
G27941	SAJWA71C64SG27941
G27955	SAJWA71C64SG27955
G25745	SAJWA71C74SG25745
G25857	SAJWA71C74SG25857
G25874	SAJWA71C74SG25874
G25986	SAJWA71C74SG25986
G26037	SAJWA71C74SG26037
G26054	SAJWA71C74SG26054
G26085	SAJWA71C74SG26085
G26099	SAJWA71C74SG26099
G26104	SAJWA71C74SG26104
G26118	SAJWA71C74SG26118
G26121	SAJWA71C74SG26121
G26149	SAJWA71C74SG26149
G26152	SAJWA71C74SG26152
G26183	SAJWA71C74SG26183
G26197	SAJWA71C74SG26197
G26233	SAJWA71C74SG26233
G26345	SAJWA71C74SG26345
G26569	SAJWA71C74SG26569
G26698	SAJWA71C74SG26698
G26720	SAJWA71C74SG26720
G26765	SAJWA71C74SG26765
G26877	SAJWA71C74SG26877
G27043	SAJWA71C74SG27043
G27219	SAJWA71C74SG27219
G27303	SAJWA71C74SG27303
G27415	SAJWA71C74SG27415
G27513	SAJWA71C74SG27513
G27527	SAJWA71C74SG27527
G27561	SAJWA71C74SG27561
G27737	SAJWA71C74SG27737
G27818	SAJWA71C74SG27818
G26046	SAJWA71C84SG26046
G26063	SAJWA71C84SG26063
G26080	SAJWA71C84SG26080
G26113	SAJWA71C84SG26113
G26127	SAJWA71C84SG26127
G26130	SAJWA71C84SG26130
G26144	SAJWA71C84SG26144
G26158	SAJWA71C84SG26158
G26161	SAJWA71C84SG26161
G26208	SAJWA71C84SG26208
G26211	SAJWA71C84SG26211
G26225	SAJWA71C84SG26225
G26242	SAJWA71C84SG26242
G26323	SAJWA71C84SG26323
G26340	SAJWA71C84SG26340
G26385	SAJWA71C84SG26385
G26418	SAJWA71C84SG26418
G26449	SAJWA71C84SG26449
G26466	SAJWA71C84SG26466
G26726	SAJWA71C84SG26726
G26869	SAJWA71C84SG26869
G27049	SAJWA71C84SG27049
G27083	SAJWA71C84SG27083
G27133	SAJWA71C84SG27133
G27309	SAJWA71C84SG27309
G27407	SAJWA71C84SG27407
G27505	SAJWA71C84SG27505
G27553	SAJWA71C84SG27553
G27603	SAJWA71C84SG27603
G27780	SAJWA71C84SG27780
G25844	SAJWA71C94SG25844
G25861	SAJWA71C94SG25861
G25875	SAJWA71C94SG25875
G25908	SAJWA71C94SG25908
G25911	SAJWA71C94SG25911
G26010	SAJWA71C94SG26010
G26024	SAJWA71C94SG26024
G26055	SAJWA71C94SG26055
G26072	SAJWA71C94SG26072
G26105	SAJWA71C94SG26105
G26119	SAJWA71C94SG26119
G26122	SAJWA71C94SG26122
G26136	SAJWA71C94SG26136
G26153	SAJWA71C94SG26153
G26203	SAJWA71C94SG26203
G26217	SAJWA71C94SG26217
G26279	SAJWA71C94SG26279
G26394	SAJWA71C94SG26394

Chassis No.	Full VIN	Chassis No.	Full VIN
G26413	SAJWA71C94SG26413	G26372	SAJWA73B14TG26372
G26430	SAJWA71C94SG26430	G26646	SAJWA73B14TG26646
G26685	SAJWA71C94SG26685	G26842	SAJWA73B14TG26842
G26752	SAJWA71C94SG26752	G27182	SAJWA73B14TG27182
G26783	SAJWA71C94SG26783	G27246	SAJWA73B14TG27246
G27013	SAJWA71C94SG27013	G27442	SAJWA73B14TG27442
G27285	SAJWA71C94SG27285	G27618	SAJWA73B14TG27618
G27299	SAJWA71C94SG27299	G27666	SAJWA73B14TG27666
G27352	SAJWA71C94SG27352	G27943	SAJWA73B14TG27943
G27383	SAJWA71C94SG27383	G25845	SAJWA73B24TG25845
G27495	SAJWA71C94SG27495	G26185	SAJWA73B24TG26185
G27531	SAJWA71C94SG27531	G27188	SAJWA73B24TG27188
G27769	SAJWA71C94SG27769	G27322	SAJWA73B24TG27322
G27903	SAJWA71C94SG27903	G27353	SAJWA73B24TG27353
G27920	SAJWA71C94SG27920	G27420	SAJWA73B24TG27420
G25786	SAJWA71CX4SG25786	G27532	SAJWA73B24TG27532
G25867	SAJWA71CX4SG25867	G27580	SAJWA73B24TG27580
G25917	SAJWA71CX4SG25917	G26213	SAJWA73B34TG26213
G25920	SAJWA71CX4SG25920	G26230	SAJWA73B34TG26230
G25979	SAJWA71CX4SG25979	G26406	SAJWA73B34TG26406
G25982	SAJWA71CX4SG25982	G26986	SAJWA73B34TG26986
G26016	SAJWA71CX4SG26016	G27278	SAJWA73B34TG27278
G26033	SAJWA71CX4SG26033	G27300	SAJWA73B34TG27300
G26064	SAJWA71CX4SG26064	G27426	SAJWA73B34TG27426
G26095	SAJWA71CX4SG26095	G27474	SAJWA73B34TG27474
G26114	SAJWA71CX4SG26114	G27538	SAJWA73B34TG27538
G26212	SAJWA71CX4SG26212	G25913	SAJWA73B44TG25913
G26226	SAJWA71CX4SG26226	G25958	SAJWA73B44TG25958
G26260	SAJWA71CX4SG26260	G25975	SAJWA73B44TG25975
G26291	SAJWA71CX4SG26291	G25992	SAJWA73B44TG25992
G26310	SAJWA71CX4SG26310	G26009	SAJWA73B44TG26009
G26422	SAJWA71CX4SG26422	G26026	SAJWA73B44TG26026
G26677	SAJWA71CX4SG26677	G26043	SAJWA73B44TG26043
G26730	SAJWA71CX4SG26730	G26270	SAJWA73B44TG26270
G26775	SAJWA71CX4SG26775	G26298	SAJWA73B44TG26298
G26825	SAJWA71CX4SG26825	G26656	SAJWA73B44TG26656
G26873	SAJWA71CX4SG26873	G27130	SAJWA73B44TG27130
G26999	SAJWA71CX4SG26999	G27242	SAJWA73B44TG27242
G27165	SAJWA71CX4SG27165	G27290	SAJWA73B44TG27290
G27375	SAJWA71CX4SG27375	G27306	SAJWA73B44TG27306
G27439	SAJWA71CX4SG27439	G27368	SAJWA73B44TG27368
G27487	SAJWA71CX4SG27487	G27404	SAJWA73B44TG27404
G27523	SAJWA71CX4SG27523	G27452	SAJWA73B44TG27452
G27781	SAJWA71CX4SG27781	G27516	SAJWA73B44TG27516
G25794	SAJWA73B04TG25794	G27628	SAJWA73B44TG27628
G26315	SAJWA73B04TG26315	G25743	SAJWA73B54TG25743
G26332	SAJWA73B04TG26332	G25998	SAJWA73B54TG25998
G27092	SAJWA73B04TG27092	G26049	SAJWA73B54TG26049
G27528	SAJWA73B04TG27528	G26455	SAJWA73B54TG26455
G27724	SAJWA73B04TG27724	G27086	SAJWA73B54TG27086
G27867	SAJWA73B04TG27867	G27198	SAJWA73B54TG27198
G25805	SAJWA73B14TG25805	G27220	SAJWA73B54TG27220
G26145	SAJWA73B14TG26145	G27332	SAJWA73B54TG27332
G26338	SAJWA73B14TG26338	G27752	SAJWA73B54TG27752

Chassis No.	Full VIN
G27816	SAJWA73B54TG27816
G27895	SAJWA73B54TG27895
G26304	SAJWA73B64TG26304
G26321	SAJWA73B64TG26321
G26366	SAJWA73B64TG26366
G26383	SAJWA73B64TG26383
G26433	SAJWA73B64TG26433
G26481	SAJWA73B64TG26481
G26576	SAJWA73B64TG26576
G26741	SAJWA73B64TG26741
G26772	SAJWA73B64TG26772
G26836	SAJWA73B64TG26836
G27050	SAJWA73B64TG27050
G27114	SAJWA73B64TG27114
G27226	SAJWA73B64TG27226
G27372	SAJWA73B64TG27372
G27484	SAJWA73B64TG27484
G27548	SAJWA73B64TG27548
G27923	SAJWA73B64TG27923
G25856	SAJWA73B74TG25856
G26134	SAJWA73B74TG26134
G26151	SAJWA73B74TG26151
G26196	SAJWA73B74TG26196
G26389	SAJWA73B74TG26389
G26439	SAJWA73B74TG26439
G26604	SAJWA73B74TG26604
G26778	SAJWA73B74TG26778
G27560	SAJWA73B74TG27560
G25879	SAJWA73B84TG25879
G26448	SAJWA73B84TG26448
G26465	SAJWA73B84TG26465
G27082	SAJWA73B84TG27082
G27194	SAJWA73B84TG27194
G27230	SAJWA73B84TG27230
G27258	SAJWA73B84TG27258
G27342	SAJWA73B84TG27342
G27602	SAJWA73B84TG27602
G27650	SAJWA73B84TG27650
G25941	SAJWA73B94TG25941
G26703	SAJWA73B94TG26703
G26751	SAJWA73B94TG26751
G26782	SAJWA73B94TG26782
G26846	SAJWA73B94TG26846
G27012	SAJWA73B94TG27012
G27124	SAJWA73B94TG27124
G27284	SAJWA73B94TG27284
G27432	SAJWA73B94TG27432
G27480	SAJWA73B94TG27480
G27608	SAJWA73B94TG27608
G27804	SAJWA73B94TG27804
G27902	SAJWA73B94TG27902
G25737	SAJWA73BX4TG25737
G25947	SAJWA73BX4TG25947
G25964	SAJWA73BX4TG25964
G26015	SAJWA73BX4TG26015
G26032	SAJWA73BX4TG26032
G26077	SAJWA73BX4TG26077
G26094	SAJWA73BX4TG26094
G26287	SAJWA73BX4TG26287
G26788	SAJWA73BX4TG26788
G27018	SAJWA73BX4TG27018
G27262	SAJWA73BX4TG27262
G27357	SAJWA73BX4TG27357
G27388	SAJWA73BX4TG27388
G27410	SAJWA73BX4TG27410
G25694	SAJWA74C04SG25694
G25744	SAJWA74C04SG25744
G25937	SAJWA74C04SG25937
G25940	SAJWA74C04SG25940
G25999	SAJWA74C04SG25999
G26005	SAJWA74C04SG26005
G26053	SAJWA74C04SG26053
G26084	SAJWA74C04SG26084
G26201	SAJWA74C04SG26201
G26246	SAJWA74C04SG26246
G26277	SAJWA74C04SG26277
G26280	SAJWA74C04SG26280
G26506	SAJWA74C04SG26506
G26537	SAJWA74C04SG26537
G26599	SAJWA74C04SG26599
G26845	SAJWA74C04SG26845
G26859	SAJWA74C04SG26859
G26943	SAJWA74C04SG26943
G27011	SAJWA74C04SG27011
G27557	SAJWA74C04SG27557
G27641	SAJWA74C04SG27641
G27901	SAJWA74C04SG27901
G25719	SAJWA74C14SG25719
G25722	SAJWA74C14SG25722
G25753	SAJWA74C14SG25753
G25784	SAJWA74C14SG25784
G25946	SAJWA74C14SG25946
G26059	SAJWA74C14SG26059
G26062	SAJWA74C14SG26062
G26093	SAJWA74C14SG26093
G26143	SAJWA74C14SG26143
G26160	SAJWA74C14SG26160
G26207	SAJWA74C14SG26207
G26224	SAJWA74C14SG26224
G26255	SAJWA74C14SG26255
G26286	SAJWA74C14SG26286
G26305	SAJWA74C14SG26305
G26322	SAJWA74C14SG26322
G26353	SAJWA74C14SG26353
G26384	SAJWA74C14SG26384
G26532	SAJWA74C14SG26532
G26563	SAJWA74C14SG26563
G26613	SAJWA74C14SG26613
G26675	SAJWA74C14SG26675
G26823	SAJWA74C14SG26823

Chassis No.	Full VIN	Chassis No.	Full VIN
G26871	SAJWA74C14SG26871	G25830	SAJWA74C44SG25830
G26997	SAJWA74C14SG26997	G25889	SAJWA74C44SG25889
G27051	SAJWA74C14SG27051	G25956	SAJWA74C44SG25956
G27115	SAJWA74C14SG27115	G25973	SAJWA74C44SG25973
G27213	SAJWA74C14SG27213	G25987	SAJWA74C44SG25987
G27311	SAJWA74C14SG27311	G26038	SAJWA74C44SG26038
G27339	SAJWA74C14SG27339	G26041	SAJWA74C44SG26041
G25728	SAJWA74C24SG25728	G26198	SAJWA74C44SG26198
G25731	SAJWA74C24SG25731	G26234	SAJWA74C44SG26234
G25809	SAJWA74C24SG25809	G26248	SAJWA74C44SG26248
G25812	SAJWA74C24SG25812	G26251	SAJWA74C44SG26251
G25843	SAJWA74C24SG25843	G26265	SAJWA74C44SG26265
G25969	SAJWA74C24SG25969	G26444	SAJWA74C44SG26444
G26068	SAJWA74C24SG26068	G26458	SAJWA74C44SG26458
G26071	SAJWA74C24SG26071	G26492	SAJWA74C44SG26492
G26166	SAJWA74C24SG26166	G26637	SAJWA74C44SG26637
G26362	SAJWA74C24SG26362	G26797	SAJWA74C44SG26797
G26426	SAJWA74C24SG26426	G27111	SAJWA74C44SG27111
G26474	SAJWA74C24SG26474	G27335	SAJWA74C44SG27335
G26488	SAJWA74C24SG26488	G27545	SAJWA74C44SG27545
G26510	SAJWA74C24SG26510	G25691	SAJWA74C54SG25691
G26619	SAJWA74C24SG26619	G25707	SAJWA74C54SG25707
G26653	SAJWA74C24SG26653	G25710	SAJWA74C54SG25710
G26734	SAJWA74C24SG26734	G25738	SAJWA74C54SG25738
G26863	SAJWA74C24SG26863	G25741	SAJWA74C54SG25741
G26913	SAJWA74C24SG26913	G25934	SAJWA74C54SG25934
G26961	SAJWA74C24SG26961	G25965	SAJWA74C54SG25965
G26989	SAJWA74C24SG26989	G25996	SAJWA74C54SG25996
G27253	SAJWA74C24SG27253	G26002	SAJWA74C54SG26002
G27575	SAJWA74C24SG27575	G26047	SAJWA74C54SG26047
G27916	SAJWA74C24SG27916	G26050	SAJWA74C54SG26050
G25818	SAJWA74C34SG25818	G26078	SAJWA74C54SG26078
G25821	SAJWA74C34SG25821	G26081	SAJWA74C54SG26081
G25849	SAJWA74C34SG25849	G26274	SAJWA74C54SG26274
G25852	SAJWA74C34SG25852	G26484	SAJWA74C54SG26484
G25883	SAJWA74C34SG25883	G26498	SAJWA74C54SG26498
G26175	SAJWA74C34SG26175	G26520	SAJWA74C54SG26520
G26368	SAJWA74C34SG26368	G26663	SAJWA74C54SG26663
G26371	SAJWA74C34SG26371	G26744	SAJWA74C54SG26744
G26399	SAJWA74C34SG26399	G26789	SAJWA74C54SG26789
G26452	SAJWA74C34SG26452	G27277	SAJWA74C54SG27277
G26502	SAJWA74C34SG26502	G27571	SAJWA74C54SG27571
G26516	SAJWA74C34SG26516	G27649	SAJWA74C54SG27649
G26595	SAJWA74C34SG26595	G25697	SAJWA74C64SG25697
G26631	SAJWA74C34SG26631	G25716	SAJWA74C64SG25716
G26855	SAJWA74C34SG26855	G25747	SAJWA74C64SG25747
G26919	SAJWA74C34SG26919	G25750	SAJWA74C64SG25750
G27147	SAJWA74C34SG27147	G25943	SAJWA74C64SG25943
G27181	SAJWA74C34SG27181	G26008	SAJWA74C64SG26008
G27469	SAJWA74C34SG27469	G26056	SAJWA74C64SG26056
G27617	SAJWA74C34SG27617	G26087	SAJWA74C64SG26087
G27925	SAJWA74C34SG27925	G26090	SAJWA74C64SG26090
G27956	SAJWA74C34SG27956	G26204	SAJWA74C64SG26204
G25701	SAJWA74C44SG25701	G26249	SAJWA74C64SG26249

Chassis No.	Full VIN
G26302	SAJWA74C64SG26302
G26316	SAJWA74C64SG26316
G26381	SAJWA74C64SG26381
G26591	SAJWA74C64SG26591
G26669	SAJWA74C64SG26669
G26722	SAJWA74C64SG26722
G26879	SAJWA74C64SG26879
G26977	SAJWA74C64SG26977
G27143	SAJWA74C64SG27143
G27725	SAJWA74C64SG27725
G25725	SAJWA74C74SG25725
G25806	SAJWA74C74SG25806
G25837	SAJWA74C74SG25837
G25840	SAJWA74C74SG25840
G25949	SAJWA74C74SG25949
G25952	SAJWA74C74SG25952
G26065	SAJWA74C74SG26065
G26096	SAJWA74C74SG26096
G26258	SAJWA74C74SG26258
G26289	SAJWA74C74SG26289
G26292	SAJWA74C74SG26292
G26308	SAJWA74C74SG26308
G26311	SAJWA74C74SG26311
G26356	SAJWA74C74SG26356
G26387	SAJWA74C74SG26387
G26390	SAJWA74C74SG26390
G26647	SAJWA74C74SG26647
G26728	SAJWA74C74SG26728
G26907	SAJWA74C74SG26907
G26969	SAJWA74C74SG26969
G27233	SAJWA74C74SG27233
G27457	SAJWA74C74SG27457
G25815	SAJWA74C84SG25815
G25846	SAJWA74C84SG25846
G25877	SAJWA74C84SG25877
G25880	SAJWA74C84SG25880
G25927	SAJWA74C84SG25927
G26169	SAJWA74C84SG26169
G26172	SAJWA74C84SG26172
G26334	SAJWA74C84SG26334
G26396	SAJWA74C84SG26396
G26432	SAJWA74C84SG26432
G26480	SAJWA74C84SG26480
G26625	SAJWA74C84SG26625
G26687	SAJWA74C84SG26687
G26740	SAJWA74C84SG26740
G26785	SAJWA74C84SG26785
G26849	SAJWA74C84SG26849
G26852	SAJWA74C84SG26852
G26933	SAJWA74C84SG26933
G26947	SAJWA74C84SG26947
G26981	SAJWA74C84SG26981
G27001	SAJWA74C84SG27001
G27175	SAJWA74C84SG27175
G27189	SAJWA74C84SG27189
G27645	SAJWA74C84SG27645
G27919	SAJWA74C84SG27919
G25824	SAJWA74C94SG25824
G25855	SAJWA74C94SG25855
G25886	SAJWA74C94SG25886
G26178	SAJWA74C94SG26178
G26181	SAJWA74C94SG26181
G26195	SAJWA74C94SG26195
G26214	SAJWA74C94SG26214
G26231	SAJWA74C94SG26231
G26262	SAJWA74C94SG26262
G26603	SAJWA74C94SG26603
G26813	SAJWA74C94SG26813
G26875	SAJWA74C94SG26875
G26925	SAJWA74C94SG26925
G26939	SAJWA74C94SG26939
G26973	SAJWA74C94SG26973
G27041	SAJWA74C94SG27041
G27265	SAJWA74C94SG27265
G27461	SAJWA74C94SG27461
G27511	SAJWA74C94SG27511
G27637	SAJWA74C94SG27637
G27881	SAJWA74C94SG27881
G25704	SAJWA74CX4SG25704
G25735	SAJWA74CX4SG25735
G25833	SAJWA74CX4SG25833
G25959	SAJWA74CX4SG25959
G25962	SAJWA74CX4SG25962
G25993	SAJWA74CX4SG25993
G26044	SAJWA74CX4SG26044
G26075	SAJWA74CX4SG26075
G26139	SAJWA74CX4SG26139
G26156	SAJWA74CX4SG26156
G26187	SAJWA74CX4SG26187
G26190	SAJWA74CX4SG26190
G26268	SAJWA74CX4SG26268
G26271	SAJWA74CX4SG26271
G26299	SAJWA74CX4SG26299
G26402	SAJWA74CX4SG26402
G26416	SAJWA74CX4SG26416
G26609	SAJWA74CX4SG26609
G26903	SAJWA74CX4SG26903
G26965	SAJWA74CX4SG26965
G27047	SAJWA74CX4SG27047
G27940	SAJWA74CX4SG27940

CANADA

Chassis No.	Full VIN
G25994	SAJXA71C04SG25994
G26031	SAJXA71C04SG26031
G25854	SAJXA71C64SG25854
G26835	SAJXA71C74SG26835
G27928	SAJXA71C84SG27928
G26814	SAJXA73B14TG26814
G26974	SAJXA73B14TG26974
G26417	SAJXA73B24TG26417
G26630	SAJXA73B24TG26630
G26497	SAJXA73B44TG26497
G26662	SAJXA73B44TG26662
G26423	SAJXA73B84TG26423
G26874	SAJXA73B84TG26874
G26620	SAJXA73BX4TG26620
G26283	SAJXA74C04SG26283
G26817	SAJXA74C04SG26817
G27305	SAJXA74C04SG27305
G26132	SAJXA74C14SG26132
G26365	SAJXA74C24SG26365
G26679	SAJXA74C34SG26679
G27668	SAJXA74C34SG27668
G27735	SAJXA74C34SG27735
G26528	SAJXA74C44SG26528
G27347	SAJXA74C54SG27347
G26837	SAJXA74C64SG26837
G27065	SAJXA74C64SG27065
G27261	SAJXA74C64SG27261
G27325	SAJXA74C64SG27325
G26359	SAJXA74C74SG26359
G26393	SAJXA74C74SG26393
G26829	SAJXA74C74SG26829
G27441	SAJXA74C84SG27441
G27567	SAJXA74C84SG27567
G25990	SAJXA74C94SG25990
G26296	SAJXA74C94SG26296
G26704	SAJXA74C94SG26704
G27061	SAJXA74C94SG27061
G27805	SAJXA74C94SG27805

MEXICO

Chassis No.	Full VIN
G27506	SAJYA73R44TG27506
G26887	SAJYA74P04SG26887
G26867	SAJYA74P54SG26867
G26801	SAJYA74P84SG26801

RE: R-719 Recall – Instrument Pack Trim Edge

Vehicles Affected: 2004 MY XJ

Dear Jaguar Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

Jaguar Cars have determined that a defect relating to motor vehicle safety exists on 2004 MY XJ models. If you are a recipient of this notice this letter is to inform you that your vehicle is included in this recall.

Following is a range of the affected vehicles by Vehicle Identification Number (VIN).

- 2004 Jaguar XJ G25690-G27957

What is the problem?

During the manufacturing process, the aperture in the instrument panel through which the passenger air bag deploys may not have been correctly finished leaving sharp edges. In the event the passenger air bag was to deploy, the air bag may be ruptured by the sharp edge. If the airbag ruptured, the seat occupant may not be properly protected in the event of a crash and incur serious injury.

What will Jaguar and your Dealer do?

Jaguar Cars will inspect the passenger air bag instrument panel aperture edge finish and where necessary, remove any sharp serrated edges.

How long will it take?

The repair will take approximately quarter of an hour, although your dealer may need your vehicle for a longer time due to service scheduling requirements

What should you do?

At your earliest convenience you should contact your authorized Jaguar Dealer who will be able to make an appointment to undertake the necessary actions. To assist your Dealer please ensure that at the time of contact you have at available your applicable Vehicle Identification Number.

Moved or no longer own a Jaguar?

Please fill out the enclosed card and return it to Jaguar by simply putting it in the mail.

Should you have the need to contact Jaguar by mail, please use the following address:

Jaguar Cars
ATTN: Customer Relationship Center
555 MacArthur Boulevard
Mahwah, NJ 07430-2327

What you should do if you have already paid to have this work completed?

If you meet all the following requirements, you are eligible to receive reimbursement

1. You own or have owned a 2004 MY Jaguar XJ within the VIN range listed above.
2. You have paid for the repair to the defect outlined previously in this letter.
3. The repair was performed before April 2004
4. You have an original or legible copy of the paid repair order or invoice showing:
   - A description of the concern reported
   - Itemized parts and labor charges
   - The vehicle model and year and the vehicle identification number
   - The repair date
   - Repair mileage
   - Name and address of the authorized Jaguar Dealer or licensed repair shop
   - Your name and address at the time of the repair

If you have all of the above information, present it to the Dealers Service Manager and they will arrange reimbursement of your claim.

Please ensure that you retain copies of all of the paperwork supporting this claim.

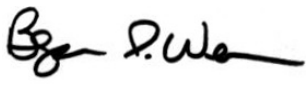
If an authorized Jaguar dealer fails or is unable to satisfactorily answer your concerns about this notice, without charge within 60 days, pursuant to law 49 U.S.C. Chapter 301, you may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 or call the toll-free Auto Safety Hotline at 888-327-4236.

Attention Leasing Agencies.

Federal regulation requires that you forward this recall notice to the lessee within 10 days.

What you should do if you have further questions?
Please contact your Jaguar Dealer or the Jaguar Customer Relationship Center at 1 800 4JAGUAR (1 800-452-4827), option 9 or by e-mail at jaguarowner@jaguar.com.

Sincerely,



Benjamin I. Weiner
Customer Satisfaction Manager

Incorrect Gear Selection – ZF 6 Speed Automatic Transmission – Recall Action R513

MODEL	2003-04 S-TYPE 2003-04 XK 2004 MY XJ range
VIN	M44998-M96322 A29406-A37133 G00001-G13779

Issue:

A concern has been identified on 2003-04 MY vehicles within the above VIN ranges that are equipped with the six-speed automatic transmission.

If Drive (D) is selected with the vehicle stationary, the transmission may engage Reverse (R) if there is insufficient fluid pressure in the transmission and/or a sticking valve within the transmission. If this condition is present, the vehicle will default to Mechanical Limp Home mode and the Malfunction Indicator Lamp (MIL) will illuminate.

With the vehicle moving in a forward direction, reverse may engage without any manual input when the transmission is in first, second or third gear, as a result of transmission fluid loss allowing the fluid pressure to decrease. The vehicle will default to Mechanical Limp Home mode. The MIL lamp will illuminate if the transmission fluid pressure falls to below 4.1 bar.

RECALL

Action:

Reprogram the Transmission Control Module (TCM) on all vehicles within the above VIN range, to the latest condition using Worldwide Diagnostic System (WDS) release **JTP 759/29 or later.**

All unsold vehicles or vehicles that have not been handed over to the customer must be repaired prior to sale or onward distribution.

Jaguar will be writing to all owners of affected vehicles requesting them to contact their nearest dealer as soon as possible to arrange for the TCM to be reprogrammed at the earliest opportunity.

NOTE: THE INFORMATION IN TECHNICAL BULLETINS IS INTENDED FOR USE BY TRAINED, PROFESSIONAL TECHNICIANS WITH THE KNOWLEDGE, TOOLS, AND EQUIPMENT TO DO THE JOB PROPERLY AND SAFELY. IT INFORMS THESE TECHNICIANS OF CONDITIONS THAT MAY OCCUR ON SOME VEHICLES, OR PROVIDES INFORMATION THAT COULD ASSIST IN PROPER VEHICLE SERVICE. THE PROCEDURES SHOULD NOT BE PERFORMED BY "DO-IT-YOURSELFERS." DO NOT ASSUME THAT A CONDITION DESCRIBED AFFECTS YOUR CAR. CONTACT A JAGUAR RETAILER TO DETERMINE WHETHER THE BULLETIN APPLIES TO YOUR VEHICLE.

To allow the transmission to adapt to the customer's driving requirements after the TCM has been reprogrammed, the vehicle will need to be driven, by the customer, for approximately 50 miles (80 kilometers) without using the sport mode switch. This information must be communicated verbally to the customer when the vehicle is booked in for the repair to be undertaken.

The reprogramming of the TCM is dependant upon the temperature of the transmission. If the transmission is not within the specified temperature values for the TCM to be reprogrammed, the retailer will need to consider the level of courtesy service that should be provided to customers while performing this action.

OPEN SERVICE ACTIONS

This is an ideal opportunity to ensure that any outstanding Service Actions are completed on all vehicles included within this Recall Action. A list of the current open service actions is shown below. Please ensure that you check that the vehicle is affected by the service action prior to confirming the booking with your customers so that suitable time and parts are made available prior to the repair visit. This can be done by using the outstanding service action function within DDW, using your own internal records and by checking the original service action bulletin. It is also important that you ensure that the repair has not already been completed, as **NO** repeat service action claims will be accepted.

S151 Supercharger Drive Belt Idler Pulley Loose - S-TYPE R
S157 V6 Exchange Engine Replacement - S-TYPE
S159 Water Ingress into Throttle Position Sensor - S-TYPE R
S506 Lack of Power Assistance - XK
S712 Coolant Hose Incorrectly Routed - XJR
S713 Coolant Reservoir Bleed Screw Re-torque - XJ
S717 Oil Cooler Pipe Wearing on Cross Brace - XJR
S840 Battery Quiescent Drain - XK
S844 OBD System Readiness Flag P1111 Fails to Set - XKR

WORKSHOP PROCEDURE

Before reprogramming the Transmission Control Module (TCM) ensure that the following requirements are met:

- The Portable Test Unit (PTU) is docked on the WDS base station, with the base station plugged in to line voltage.
- Vehicle battery is charged to a minimum of 12.5 volts.
- All Diagnostic Trouble Codes (DTCs) are cleared.
- Transmission oil temperature is within the recommended value of between minus 55 degrees Celsius and plus 80 degrees Celsius.

1. Open door.
2. Ensure ignition is switched off, hand brake is on and selector lever is in Park (P).

3. Position WDS alongside the vehicle, switch WDS on and allow software to load.

> **Note:** WDS must be loaded with the latest issue of software (WDS 29 or later.)

> ⚠ **Caution: Never use software prior to WDS 29 to reprogram the TCM since this will return the calibration to an earlier level.**

4. Connect PTU to vehicle using diagnostic cable.
5. Enter the VIN and navigate to the vehicle configuration main menu.
6. From the vehicle configuration main menu, navigate to and run the 'Re-configure existing TCM' application.

> **Note:** As part of the reprogram process, a pop up screen stating 'select the access route you require' will be displayed, at this point the technician must select **'normal access'**.

> **Note:** If the message 'The vehicle does not require reprogramming – the latest software is installed. Do you wish to continue?' appears, the dealer MUST SELECT NO. This message indicates that the vehicle has undergone a previous software update and does not require reprogramming. No further action is required.

7. After successful reprogramming of TCM, switch off, disconnect, and return the WDS to the original location.
8. Close door.

APPLYING MODIFICATION LABEL

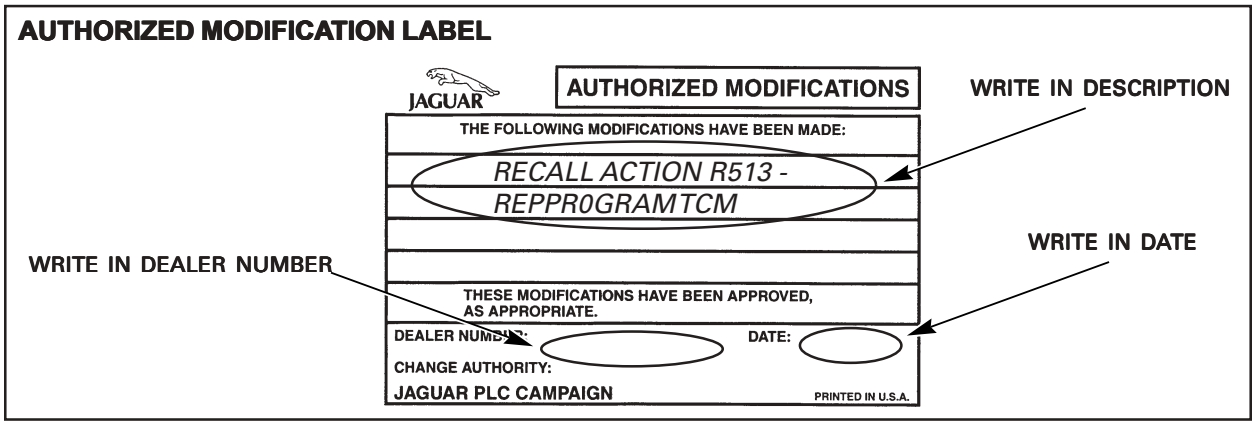


ILLUSTRATION 1

Fill out an authorized modification label (Illustration 1), enter the dealer number and date on the authorized modification label. List any other service actions that have been performed at the same time. Apply the label to the A-post on S-TYPE and XJ, and on the B-post on XK. Apply the clear sheet over the label.

Warranty Information:

Warranty claims should be submitted quoting program code R513 together with the relevant option code from the table below. This will result in payment of the appropriate time to reprogram the TCM.

The options that allow for drive in/drive out should only be claimed if the vehicle is brought into the workshop for only this recall action.

Recall Action R513

Model	**VIN Range**
2003 MY S-TYPE 3.0L	**3F**M44998 - **3F**M94764
2003 MY S-TYPE 4.0L	**3H**M44998 - **3H**M94764
2003 MY S-TYPE R	**31**M44998 - **31**M94764
2004 MY S-TYPE 3.0L	**4F**M94765 - **4F**M96322
2004 MY S-TYPE 4.0L	**4H**M94765 - **4H**M96322
2004 MY S-TYPE R	**41**M94765 - **41**M96322
2004 MY XJ	**4T**G00001 - **4T**G13779
2004 MY XJR	**4T**G00001 - **4T**G13779
2003 MY XK	**32**A29406 - **32**A36873
2003 MY XKR	**33**A29406 - **33**A36873
2004 MY XK	**42**A36874 - **42**A37133
2004 MY XKR	**43**A36874 - **43**A37133

Program Code	Option	Description	SRO	Time	Part Number	Part Description	Qty
R513	B	Re-program TCM	86.93.36	0.4 hrs.	-	-	-
R513	C	Re-program TCM	86.93.36	0.4 hrs.	-	-	-
		Drive in/drive out	10.10.10	0.1 hrs.			

NOTE: Always perform a DDW claim search first to determine whether this recall action has been performed on this vehicle. The "Review Claim History" function will provide a listing of all claims against the vehicle. If this recall action number appears in the program code field, do not perform this recall action.

RE: R-513 Recall – ZF 6HP26 Automatic Transmission

Vehicles Affected: All 2004 MY XJ, 2003-2004 MY S-Type and XK Series.

Dear Jaguar Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

Jaguar Cars has determined that a defect relating to motor vehicle safety exists on 2003-2004 models. If you are a recipient of this notice, and an owner of one of the vehicles within the VIN range listed below, this letter is to inform you that your vehicle is included in this recall.

Vehicles within this vehicle identification number range (VIN) may experience faulty automatic transmission operation.

Following is a breakdown of the affected vehicles by model and (VIN) range.

- 2004 Jaguar XJ G00001-G13779
- 2003-2004 Jaguar S-Type M44998-M96322
- 2003-2004 Jaguar XK A29406-A37133

What is the problem?

Investigations have determined that under certain operating conditions the automatic transmission may fail to properly engage the correct mode of vehicle direction as selected by the driver.

Before this can happen the following must occur:

- The transmission fluid level must be very low or a sticking valve within the transmission must exist resulting in low oil pressure in the transmission.
- The transmission would have defaulted to mechanical limp home mode. This occurrence would cause the amber secondary lamp on the instrument cluster to illuminate and the "Transmission Fault" message to show in the message center.

The failure may cause the transmission to mistakenly select reverse gear without any warning or indication to the driver. This could happen with the vehicle stationary or in a forward motion, with the gearshift lever in the "Drive" detent. There is no risk of incorrect vehicle motion in gear positions Park, Reverse, or Neutral. This event will not occur while the transmission has shifted to 4th, 5th or 6th gears, the normal cruising gears.

While it is unlikely that you will experience this issue, it is important to schedule an appointment with your dealer to have this repair performed.

What will Jaguar and your Dealer do?

Jaguar Cars will re-program the transmission control module with the latest calibration files to ensure that the transmission cannot unexpectedly select reverse in the event of the above conditions occurring.

What should you do?

At your earliest convenience you should contact your authorized Jaguar Dealer who will be able to make an appointment to undertake the necessary actions. To assist your Dealer please ensure that at the time of contact you have at hand your applicable Vehicle Identification Number.

Due to vehicle scheduling and the temperature of the transmission your Dealer may need to keep your vehicle overnight to re-program the transmission control module.

Moved or no longer own a Jaguar?

Please fill out the enclosed card and return it to Jaguar by simply putting it in the mail.

Should you have the need to contact Jaguar by mail, please use the following address:

Jaguar Cars
ATTN: Customer Relationship Center
555 MacArthur Boulevard
Mahwah, NJ 07430-2327

What you should do if you have already paid to have this work completed?

If you meet all the following requirements, you are eligible to receive reimbursement

1. You own or have owned a 2004 MY Jaguar XJ, or a 2003-2004 MY, S-Type, or XK within the VIN range listed above.
2. You have paid for a reprogram to the transmission control module due to the defect outlined previously in this letter.
3. The repair was performed before March 2004
4. You have an original or legible copy of the paid repair order or invoice showing:
    - A description of the concern reported
    - Itemized parts and labor charges
    - The vehicle model and year and the vehicle identification number
    - The repair date
    - Repair mileage
    - Name and address of the authorized Jaguar Dealer or licensed repair shop
    - Your name and address at the time of the repair

If you have all of the above information, present it to the Dealerships Service Manager and they will arrange reimbursement of your claim.

Please ensure that you retain copies of all of the paperwork supporting this claim.

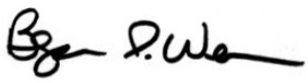
If an authorized Jaguar dealer fails or is unable to satisfactorily answer your concerns about this notice, without charge within 60 days, pursuant to law 49 U.S.C. Chapter 301, you may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 or call the toll-free Auto Safety Hotline at 888-327-4236.

Attention Leasing Agencies.

Federal regulation requires that you forward this recall notice to the lessee within 10 days.

What you should do if you have further questions?
Please contact your Jaguar Dealer or the Jaguar Customer Relationship Center at 1 800 4JAGUAR (1-800-452-4827), option 9 or by e-mail at jaguarowner@jaguar.com.

Sincerely,



Benjamin I. Weiner
Customer Satisfaction Manager

Claiming Process For Loaner Car Re-Imbursement - Recall R513

Although the actual time to perform the recall is short, we recognize that some vehicles may need to be kept for a longer period to allow the transmission to reach the specified temperature range for reprogramming. Given this fact, and our commitment to customer satisfaction, Jaguar Cars will provide **one** loaner car day reimbursement **In the event** you do need to keep the vehicle and provide a loaner car. Jaguar will reimburse you at the standard rate ($24/non-Jaguar, $40/Jaguar) over and above the normal loaner car allocation. Claiming procedures are detailed below.

Claiming procedures for 1 day loaner reimbursement

Select the corresponding program code based on your dealer's vehicle source options

- Use of Program Code ***ZZLR:***

  Under "Add - Misc. Items" select or enter "loaner or loanr2". Under "Value" enter ***$40.00***. Under "Invoice", enter the rental invoice number or applicable information. Under "Days", enter 1. **(See notes 1)**

- Use of Program Code ***ZZLS:***

  Under "Add - Misc. Items" select or enter "loaner or loanr2". Under "Value" enter ***$24.00***. Under "Invoice", enter the rental invoice number or applicable information. Under "Days", enter 1.

Notes:

1- Only those dealers that are eligible to use Loaner Car Programs ZZLA & ZZLJ may use Program Code ZZLR. **(Refer to Administration Bulletin 6-78 Issued 5/00)**

JAGUAR	XJ range	DATE 07/03	XJ100-01

SERVICE **TECHNICAL BULLETIN**

Transportation Of XJ Vehicles – Transportation And Lashing Requirements

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

The new XJ sedan vehicle is equipped with air suspension and as a result of this innovation, the correct transportation of the vehicle is of paramount importance.

The following information is given to you to ensure that transportation and lashing requirements for the vehicles are fully understood. This is to ensure that there is no possible damage to the vehicles suspension or body systems. It is important that there are no deviations from the prescribed methods listed below, and that no one should be in any doubt that, due to the sensitivity of the air suspension systems, and their effect on the vehicle during transportation, the methods of lashing / transportation listed below should always be adhered to.

AIR SUSPENSION MODES

Prior to their dispatch from the factory, all vehicles have the Air Suspension set to ***Transportation Mode***. This sets the vehicle suspension high (20 mm higher than Normal ***Customer Mode*** Ride Height) to ensure that there is sufficient ground clearance to enable loading and unloading of the vehicles correctly. The message “air suspension fault” will appear in the message center when the Transportation mode is applied to the vehicles.

TRANSPORTATION FROM PORTS TO DEALERS

Vehicles used in the transportation of vehicles from the Ports to Dealerships within the market must be equipped to carry out the prescribed transportation methods listed below and must comply with these instruction to ensure that no damage to the air suspension or body systems on the vehicles is incurred.

DEALER TO DEALER TRANSPORTATION

Transportation of vehicles between dealerships must also comply with these methods of transportation, with the responsibility of the ***Transportation Mode*** setting resting with the **supplying dealer** prior to loading the vehicle onto transport.

RIDE HEIGHT CORRECTION DURING TRANSPORTATION

If any suspension sinkage occurs, while the vehicle is in ***Transportation Mode***, the message “Vehicle too low” is displayed on the message center, the following actions must be taken to return the vehicle to its correct ride height. If this does happen, do not load or unload the vehicle until the following procedure has been completed.

Ensure that the vehicle doors are shut, and the vehicle transmission is set in “Park”, start the engine, and wait while the compressor charges the system and vehicles ride height is re-achieved, and the “Vehicle too low” message is no longer shown in the message center.

Do not apply the foot brake during this operation, and do not let the vehicle idle in “Drive” with the foot brake applied, as this will inhibit the compressor operation and will prevent the vehicle from achieving the correct ride height.

The following methods are to be used to secure the vehicle during transportation.

ROAD

Vehicles, with the suspension set in ***Transportation Mode***, must be loaded / unloaded with no under-body grounding, and the vehicles transmission must be left in “Park” and the electronic park brake applied. Retention of the vehicle is by the use of chocks and over wheel lashing, using the following options.

1. Both front wheels lashed and chocked.
2. One Front wheel and one diagonally opposite Rear Wheel lashed and chocked, plus the other Front wheel chocked.

METHOD OF LASHING

Front Wheel Lashing and Chock

Rear Wheel Lashing and Chock

JAGUAR	XJ range	DATE 05/04	XJ100-02

SERVICE **TECHNICAL BULLETIN**

Drive Belt Noise After Cold Start – Supercharger – Revised Drive Belt Available

MODEL	2004 MY XJR
VIN	G00421-G33625

Issue:

On some 2004 MY XJ range vehicles, customers may have a concern with noise from the supercharger drive belt after a cold start.

A revised drive belt has been released to address this concern.

Action:

Should a customer express concern of a noise from the supercharger drive belt from cold start, remove the supercharger drive belt to confirm that the noise stops.

If so, install a new modified supercharger drive belt, referring to Workshop Manual, section: 303-05, SRO 18.50.08).

Global Technical Reference (GTR):

Dealer Access: https://hub.franchise.jaguar.com

Internet access: http://www.jaguartechinfo.com

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Supercharger drive belt	C2C 26235	1

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Install a new supercharger drive belt	18.50.08	0.6 hrs.	C2C 26235

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JAGUAR	XJ range	DATE 06/04	XJ100-03

SERVICE **TECHNICAL BULLETIN**

Buzzing/Knocking Noise After Start Or With Ignition On – Adaptive Speed Control Module – Repair Procedure

MODEL	2004 MY XJ range
VIN	G00442-G27835

Issue:

On some 2004 MY XJ range vehicles within the above VIN range, customers may have concerns of a buzzing/knocking noise heard when the ignition is switched 'ON' or just after engine 'start-up'. The adaptive speed control module has a radar scanner inside which scans from side to side 10 times per second. In some modules the scanner hits the end stops causing a noise.

> **Note:** The buzzing/knocking noise has been confused with a timing chain/tensioner rattle and, if applicable, a supercharger noise.

A revised adaptive speed control module, which contains a contactless potentiometer and a new internal actuator, has been released to address this concern.

Action:

In case of a verified customer complaint, install a new modified adaptive speed control module referring to Workshop Manual, section: 310-03.

> **Note:** When instructed to check and adjust the speed control module leveling, carry out speed control module alignment procedure. To assist with the alignment of the new speed control module on the road refer to the procedure below from FAQ 12441.

1. Fit module to vehicle, ensuring the vehicle is level, and the radar is fitted level. (Use the electronic Jaguar levelling gauge 501-F007 as supplied with the initial S-TYPE service tools.)
2. Connect WDS to vehicle, and run "Configure new module" application. Ensure process is complete and WDS is returned to docking station. Cycle ignition before driving vehicle. The "follow" icon (Illustration 1) should now be flashing, this indicates the vehicle is in service alignment and now requires driving.

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“FOLLOW” ICON LOCATED IN INSTRUMENT CLUSTER

ILLUSTRATION 1

3. The service alignment process measures the path of stationary targets such as streetlights, railings, road signs, parked vehicles etc., and uses this data to correct for radar misalignment. Alignment will complete more quickly if more suitable targets are seen. The following recommendations will help:
   - The speed must be above 30 mph (48 km/h)
   - Try to keep the speed relatively constant. Numerous accelerations and decelerations will cause the process to take longer
   - Choose a road with plenty of road features. Use an inside or outside lane.
   - Following vehicles too closely will obscure the stationary targets from the radar, a time gap of 2 seconds is recommended.
   - A straight road will produce a quicker and better result, although the process will still operate on a curved road.
   - The time the module takes to align will vary, depending on the route, speed, number of targets, and individual module.
4. When the flashing “follow” icon light (Illustration 1) extinguishes, the system is now functional, and a desired speed can now be set by the customer and the ACC will operate as normal.

Global Technical Reference (GTR):

Dealer Access: https://hub.franchise.jaguar.com
Internet access: http://www.jaguartechinfo.com

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Adaptive speed control module	C2C 23960	1

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Install a new speed control module	19.75.26	1.4 hrs.	C2C 13813

JAGUAR	XJ range	DATE 07/03	XJ204-01

SERVICE **TECHNICAL BULLETIN**

Diagnosing/Servicing Air Suspension – Gotec Leak Detection Spray – Specified Hose Cutters

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

This bulletin provides specific recommendations when diagnosing and servicing the hoses of the air suspension on 2004 MY-on XJ range vehicles.

Action:

When carrying out air suspension pipe repairs, follow the workshop procedure outlined in JTIS section 204-05 Vehicle Dynamic Suspension, general procedures, air leaks.

> ⚠ **Caution:** When diagnosing leaks in the air suspension, **do not** use soapy water as a means for detecting the source of an air leak. Water can be harmful to the air suspension system, if it enters the air tubing. **Use only** Gotec Leak Detection Spray, part number **C2C 22398**, for this purpose.

If instructed to cut the air pipe, you must use one of the hose cutters outlined below:

- Hose cutter - 204-494 available from SPX OTC.
- Hose cutter - YA 1000A available from Snap-On.

JAGUAR	XJ range	DATE 09/03	XJ204-02

SERVICE **TECHNICAL BULLETIN**

Permanent 'High Spot' Marking On Tire Inboard Sidewall – Information

MODEL 2004 MY-ON XJ range

VIN G14559-ON

Issue:

On 2004 MY-ON XJ range vehicles from VIN G14559, a yellow paint dot (10-13 mm in diameter) is being applied to the tire inboard sidewall to identify the high spot for radial force variation.

Engineering evaluation tests have established that when installing a wheel to the hub the position of this yellow spot can influence the vehicles level of refinement.

The optimum condition is to bias the wheel on the hub spigot towards the tires yellow dot position. To achieve this optimum condition the following process should be adhered to when installing a wheel to the vehicle.

Action:

INSTALLATION OF WHEELS AND TIRE

To ensure that the optimum position of the wheel to the hub is achieved, the yellow spot (Illustration 1) must be placed in the lowest position (6 o'clock), the wheel nuts should be installed hand-tight only, and then the vehicle lowered to the ground prior to final tightening of the wheel nuts to the specified torque value.

YELLOW HIGH SPOT MARKING

ILLUSTRATION 1

NOTE: The information in Technical Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers." Do not assume that a condition described affects your car. Contact a Jaguar retailer to determine whether the Bulletin applies to your vehicle.

JAGUAR	XJ range	DATE 11/04	XJ204-S516

SERVICE **TECHNICAL BULLETIN**

Spare Tire Speed Restriction Label – Lack of Adhesion – Service Action S516

MODEL	2004 MY XJ range
VIN	Refer to VIN list

Issue:

A concern has been identified on a number of 2004 MY XJ vehicles that are listed in this bulletin. On vehicles supplied with space saver spare wheels, poor adhesion of the speed restriction label could result in the label coming loose from the space saver spare wheel.

Jaguar Cars will contact owners of the 2004 MY XJ vehicles, listed in this bulletin, to replace the spare tire label.

A number of vehicles have been repaired at the Port of Entry facility. This Service Action affects vehicles that are outside of the control of the Port of Entry facilities and any sold vehicles that have not yet been repaired.

Action:

Check the attached VIN list and DDW to determine validity of the vehicle against the Service Action to ensure that the spare tire label has not already been replaced at the port, prior to carrying out any repair. DDW will be updated to reflect those vehicles affected by this Service Action.

At the time of confirming a booking for vehicle repair, please ensure that any outstanding Field Service Actions are identified to ensure the correct parts are available and adequate workshop time is allocated for repairs to be completed at one visit.

WORKSHOP PROCEDURE

1. Open the luggage compartment and install exterior vehicle protection.
2. Reposition the luggage compartment carpet.
3. Remove the tool foam inlay.

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Note: On some vehicle variants it is not necessary to remove the wheel to gain access to the front face of the space saver spare wheel.

4. Remove the tee bolt securing the space saver spare wheel.
5. Remove the space saver spare wheel and place aside.
6. Remove the old speed restriction label from space saver spare wheel.
7. Clean the area of space saver spare wheel before installing the new label.
8. Install the new speed restriction label on the front face of the wheel (Illustration 1).

LOCATION OF SPEED RESTRICTION LABEL

ILLUSTRATION 1

9. Place the space saver spare wheel in the well.
10. Install and tighten the space saver spare wheel securing bolt.
11. Insert the tool foam inlay.
12. Reposition the luggage compartment floor carpet to the original position.
13. Remove the exterior vehicle protection and close the luggage compartment.

Global Technical Reference (GTR) Workshop Manual Information:

Dealer access: https://hub.franchise.jaguar.com

Internet access: http://www.jaguartechinfo.com

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Space saver spare wheel label	XR8 34663	1

Warranty Information:

Warranty claims should be submitted quoting program code S516 together with the appropriate option code from the table below. This will result in payment of the stated time and, where applicable, parts/miscellaneous expense codes.

The options that allow for drive in/drive out can only be claimed if the vehicle has been brought in to the workshop for this action alone to be undertaken.

Service Action S516

Refer to attached VIN list for specific VINs.

Program Code	Option	Description	SRO	Time	Part Number	Part Description	Qty
S516	D	Replace speed restriction label	74.91.13	0.2 hrs.	XR8 34663	Speed restriction label	1
S516	E	Replace speed restriction label	74.91.13	0.2 hrs.	XR8 34663	Speed restriction label	1
		Drive in/Drive out	10.10.10	0.1 hrs.			

NOTE: Always perform a DDW claim search first to determine whether this service action has been performed on this vehicle. The “Review Claim History” function will provide a listing of all claims against the vehicle. If this service action number appears in the program code field, do not perform this service action.

VEHICLES AFFECTED BY THIS SERVICE ACTION

Canada

VIN	Full VIN
G31997	SAJXA73B54TG31997
G32202	SAJXA73B04TG32202

USA

VIN	Full VIN	DLR NAME
G32561	SAJWA73B14TG32561	Jaguar of Tampa

JAGUAR CARS
555 MacARTHUR BOULEVARD
MAHWAH NJ 07430

T 800 4 JAGUAR
www.jaguar.com

November 2004

RE: S516 Service Action - Speed Restriction Label - Lack of Adhesion

Dear Jaguar Owner

Jaguar Cars has identified a concern relating to the speed restriction label that is fitted to the space saver spare tire. If you are a recipient of this notice, and an owner of one of the vehicles within the VIN range, this letter is to inform you that your vehicle is included in this service action.

The following is a breakdown of the affected vehicles by model year, model and (VIN) range.

➢ 2004 Jaguar X-TYPE	E00414 - E06685
➢ 2005 Jaguar S-TYPE	N17674 - N20678
➢ 2004 XJ Range	G31346 - G32734

What is the problem?

The speed restriction label fitted to the space saver spare wheel in your vehicle may detach due to poor adhesion.

What will Jaguar and your Jaguar Dealer do?

An authorized Jaguar dealer will replace the speed restriction label fitted to the space saver spare wheel on your vehicle.

What should you do?

At your earliest convenience you should contact your authorized Jaguar dealer who will be able to make an appointment to undertake the necessary actions. To assist your dealer please, ensure that at the time of contact you have at hand your applicable Vehicle Identification Number.

How long will it take?

The time to complete the repair on your vehicle is approximately 15 minutes. However due to vehicle scheduling your dealer may need to keep your vehicle longer to complete the repair.

Moved or no longer own a Jaguar?

Please fill out the enclosed card and return it to Jaguar by simply putting it in the mail.

Attention Leasing Agencies

Please forward this Service Action notice to the lessee within 10 days.

What should you do if you have further questions?

Please contact your Jaguar Dealer or the Jaguar Customer Relationship Center at 1 800 4JAGUAR (1-800-452-4827), option 9 or by e-mail at jaguarowner@jaguar.com, or by mail using the return address listed above.

Sincerely yours,

Benjamin I. Weiner
Customer Satisfaction Manager

JAGUAR	XJ range	DATE 10/03	XJ204-03

SERVICE **TECHNICAL BULLETIN**

Shock Absorbers – Revised Warranty Replacement Policy

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

The policy of replacing shock absorbers in pairs after the remaining shock absorber on the same axle has covered more than 25,000 miles is now rescinded.

The policy of replacing shock absorbers has been revised as follows:

During the warranty life of the vehicle, the failed part **only** will be changed using the following criteria:

- Only one shock absorber across an axle exhibits a defect.
- The part number of the replacement shock absorber is identical to the one being removed.
- The vehicle has completed less than 60,000 miles (96,000 kilometers).

If, after replacement of the failed part, the remaining shock absorber on the same axle is subsequently found to be defective, the other shock absorber must be replaced as a separate operation with a separate claim submitted for this repair.

Action:

Effective immediately, observe the above points when replacing a shock absorber under warranty.

NOTE: The information in Technical Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers." Do not assume that a condition described affects your car. Contact a Jaguar retailer to determine whether the Bulletin applies to your vehicle.

JAGUAR	XJ range	DATE 06/04 Amended 06/04	XJ303-02

SERVICE **TECHNICAL BULLETIN**

MIL On – DTC P0128 Stored – Repair Procedure

MODEL	2004 MY XJ range
VIN	G00001-**G27197**

Remove and destroy Bulletin XJ303-02, dated 06/04.
Replace with this Bulletin.
An ending VIN has been added.

Issue:

Some 2004 MY-ON XJ range vehicles may exhibit a condition where the Malfunction Indicator Lamp (MIL) is lit with Diagnostic Trouble Code (DTC) P0128 (thermostat range/performance faults) stored in the Engine Control Module (ECM).

Action:

In case of a verified customer complaint of the above condition, the ECM should be re-configured using the Worldwide Diagnostic System (WDS) with software release JTP 759/31 or later. Should a customer express concern, follow the workshop procedure outlined below.

WORKSHOP PROCEDURE

1. Ensure coolant system level is correct and there are no leaks.

   Note: Any coolant leak repairs are to be carried out as a separate Warranty Claim.

2. Position WDS alongside vehicle, switch Portable Test Unit (PTU) 'ON' and allow software to load.

   Note: Ensure WDS is loaded with software release JTP 759/31 or later.

3. Connect PTU to vehicle using diagnostic cable.
4. Enter VIN and navigate to the DTC monitor.

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5. Ensure the ECM and Transmission Control Module (TCM) are free of DTCs.

> **Note:** Carry out any associated diagnostic routines and clear any DTCs. Any repairs are to be carried out as a separate Warranty Claim.

6. Navigate to ‘Configuration Main Menu’.
7. Select and run ‘re-configure existing ECM’ application.
8. After re-configuration of ECM is complete, switch ‘OFF’ PTU, disconnect from vehicle and return WDS to original location.

Global Technical Reference (GTR):

Dealer Access: https://hub.franchise.jaguar.com
Internet access: http://www.jaguartechinfo.com

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Reconfigure ECM	86.99.13	0.3 hrs.	C2C 7095

JAGUAR	XJ range	DATE 06/04 Amended 12/04	XJ303-04

SERVICE **TECHNICAL BULLETIN**

Engine Pinging/Detonation – Check Long And Short Term Fuel Trim – Reprogram ECM

MODEL	2004 MY XJ range
VIN	G00421-G34527

Remove and destroy Bulletin XJ303-04, dated 06/04.
Replace with this Bulletin.
The causal part no. and WDS software version have been updated.

Issue:

Some 2004 MY XJ range vehicles within the above VIN range, may experience engine pinging or knocking.

Action:

Should a customer experience engine detonation (pinging), check the long and short term fuel trim values using Worldwide Diagnostic System (WDS). If no faults are found, reconfigure the Engine Control Module (ECM). Follow the workshop procedure outlined below.

WORKSHOP PROCEDURE

1. Position WDS alongside vehicle, switch Portable Test Unit (PTU) 'ON' and allow software to load.

> **Note:** Ensure WDS is loaded with software release JTP 759/**35** or later.

2. Connect PTU to vehicle using diagnostic cable.
3. Enter VIN and navigate to DTC monitor.
4. Record all codes in the ECM and Transmission Control Module (TCM).

> **Note:** Carry out any associated diagnostic routines and clear any fault codes. Any repairs are to be carried out as a separate Warranty Claim.

5. Navigate to datalogger.
6. Select 'park' and run engine to normal operating temperature.

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7. Select and view signals for long term fuel trim (LTFT) bank 1 and bank 2, and short term fuel trim (STFT) bank 1 and bank 2.

> **Note:** If a reading of greater than 7% is displayed, suspect a possible air leak or fuel starvation. Check intake ducting for security and leaks. Any repairs are to be carried out as a separate Warranty Claim, then continue from step 8. If a reading of less than 7% is displayed continue from step 8.

8. Navigate to configuration main menu.
9. Select and run ‘reconfigure existing ECM’ application.
10. After successful completion, switch ‘OFF’ PTU, disconnect from vehicle and return WDS to original location.

Global Technical Reference (GTR):

Dealer Access: https://hub.franchise.jaguar.com

Internet access: http://www.jaguartechinfo.com

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Engine detonation service fix	86.93.40	0.6 hrs.	LNG 1410**CD310**

JAGUAR	XJ range	DATE 12/04	XJ303-05

SERVICE **TECHNICAL BULLETIN**

Rough Idle/Hesitation – Contaminated Fuel Injectors – Cleaning Procedure

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

Some vehicles may exhibit hesitation during acceleration or a rough idle. The MIL may also be illuminated.

Action:

In case of a customer complaint of the above condition, follow the workshop procedure outlined below.

WORKSHOP PROCEDURE

1. Position Worldwide Diagnostic System (WDS) alongside vehicle, switch Portable Test Unit (PTU) 'ON' and allow the software to load.

   Note: Ensure WDS is loaded with software release JTP 759/34 or later.

2. Connect the PTU to vehicle's DLC using diagnostic cable.
3. Enter VIN and navigate to DTC monitor.
4. Record all diagnostic trouble codes (DTC) in the Engine Control Module (ECM) and Transmission Control Module (TCM).

   Note: If any of the following DTCs: P0300 to P0308, P0171 or P0174 are present, check for loose intake components. Any repairs are to be carried out as a separate Warranty Claim. If no fault is identified with the intake components, suspect contaminated fuel injectors; continue from step 9. If no DTCs are logged, continue from step 5.

5. Navigate to datalogger.
6. Connect exhaust extraction hoses to the vehicle.
7. Select park and run engine to attain normal operating temperature.

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8. Select and view signals for long term fuel trim (LTFT) bank 1 and bank 2.

> **Note:** If a reading of greater than 10% is displayed, check for loose intake components. Any repairs are to be carried out as a separate Warranty Claim. If no fault is identified with the intake components suspect contaminated fuel injectors; continue from step 9.

Jaguar Cars recognizes that there are many types of commercially available pressurized injector cleaning kits as well as cleaners to choose from. You may use any existing equipment you have provided you are able to obtain satisfactory results.

However, if you need to purchase this equipment, Jaguar Cars recommends the Ford Motorcraft Pressurized Injector Cleaning Kit and Motorcraft pressurized injector cleaner. This equipment has been fully tested by Jaguar engineering and has been found to perform to Jaguar Specifications.

The Motorcraft Injector Cleaning kit, CM-1000 and cleaner, CM-1001 can be obtained through Excelda Manufacturing, (248) 486-3800 ext. 114 Kristi Mitchell.

> **Note:** Please have a Credit Card available when ordering

Additionally the Wynn's brand Injector cleaning kit and cleaner are also recommended, and can be obtained from a local distributor. To locate a distributor call (800) 989-8363 or visit www.wynnsusa.com.

9. Remove the necessary fuse(s) to prevent the operation of the fuel pump. Refer to the electrical guide in Global Technical Reference (GTR) or Owners hand book for fuse(s) location.
10. Start and run the engine until it stops (fuel system depressurized).

> **Note:** A DTC will be logged when the engine is run with the fuel pump fuse(s) removed.

11. Switch ignition 'OFF'.
12. Displace the spring clip from the fuel supply hose spring lock coupling where it joins the fuel rail.
13. Install special tool 310-D005 on the fuel rail supply hose.
14. Use special tool 310-D005 to disconnect the fuel rail supply hose from the fuel rail.
15. Remove special tool 310-D005.
16. Install a suitable blanking plug in the fuel supply hose.
17. For effective fuel injector cleaning, in this instance, it will be necessary to carry out the cleaning process for a continuous twenty minute period using two bottles of injector cleaner at 3.3 bar ± 0.2 bar.

18. Remove the blanking plug from the fuel supply hose.
19. Connect the fuel supply hose to the fuel rail.
20. Reinstall the fuse(s) for the fuel pump.
21. With WDS already connected, clear DTCs.

Global Technical Reference (GTR) Workshop Manual Information:
Dealer access: https://hub.franchise.jaguar.com
Internet access: http://www.jaguartechinfo.com

Parts Information:
N/A

Warranty Information:
Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Pressurized fuel injector cleaning - All types	19.91.67	1.3 hrs.	AJ8 2353

JAGUAR	XJ range	DATE 03/04	XJ211-01

SERVICE **TECHNICAL BULLETIN**

Squeaking Noise – Power Steering System – Flush System

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

On some 2004 MY-ON XJ range vehicles, a squeaking noise may be apparent from the power assisted steering system. The system can be drained and refilled with new fluid to address the customer concern.

Action:

On a customer complaint basis only, drain, refill (with fluid specified in Parts Information below) and bleed the PAS system following the workshop procedure outlined below.

WORKSHOP PROCEDURE

1. Open door.
2. Open hood, fit fender protector covers.
3. Remove power steering reservoir filler cap.
4. Raise vehicle on two-post lift.
5. Remove air deflector (see Workshop Manual, JTIS CD ROM, Section: 501-02, SRO 76.11.41).
6. Place suitable drain tray under vehicle.
7. Clean local area around the power steering, feed and return pipes to remove any road dirt.
8. Unclip power steering feed and return pipes from retaining clips.

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POWER STEERING PIPE SECURING SCREW

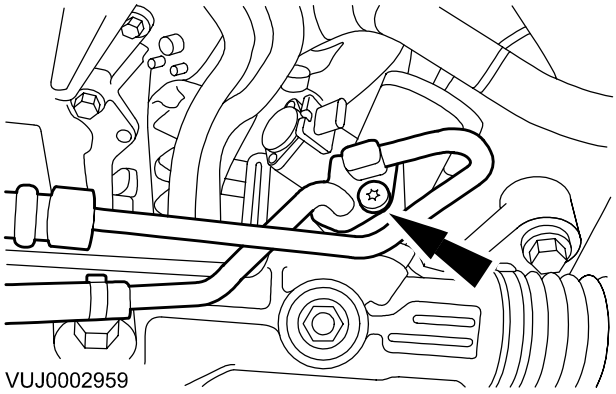

ILLUSTRATION 1

9. Remove the power steering feed and return pipes' securing screw (Illustration 1).
10. Disconnect and reposition the power steering feed and return pipes from the steering gear.
11. Allow fluid to drain from system.

> **Note:** Lower vehicle on lift and slowly cycle steering ten times lock to lock to ensure all fluid is purged from system.

12. Raise vehicle on lift, clean residual fluid from the steering gear and power steering feed and return pipes.
13. Connect and align the power steering feed and return pipes to the steering gear.

> **Note:** Existing power steering feed/return pipe seals are to remain in position during first purge operation if they are not damaged.

14. Install and tighten the power steering feed and return pipes' securing screw to 15 Nm.
15. Remove drain tray from under the vehicle.
16. Lower vehicle on lift.
17. Fill power steering reservoir with new fluid.
18. Start engine and allow to idle for two minutes while slowly cycling steering lock to lock.

> **Note:** If necessary top up fluid as air is purged from system.

19. Switch engine 'Off'.
20. Raise vehicle on lift to a suitable working height.
21. Place suitable drain tray under vehicle.
22. Repeat steps 9 - 12.
23. Remove and discard O-ring seals from the power steering feed and return pipes.

24. Lubricate and install the new O-ring seals to the power steering feed and return pipes.
25. Connect and align the power steering feed and return pipes to the steering gear.
26. Install and tighten the power steering feed and return pipes' securing screw to 15 Nm.
27. On left hand drive vehicles only, clip power steering feed and return pipes onto retaining clips.
28. Install air deflector (see Workshop Manual, JTIS CD ROM, Section: 501-02).
29. Remove drain tray from under vehicle.
30. Lower vehicle on lift and repeat steps 17 - 19.
31. Install power steering reservoir filler cap.
32. Remove fender protector covers and close hood.
33. Start engine.
34. **QUICKLY AND FORCEFULLY** turn steering to full lock. Bounce steering on/off full lock five times. Turn to opposite lock and repeat procedure.

> **Note:** Step 34 **MUST** be carried out quickly and forcefully.

35. Turn steering to full lock, hold on full lock for ONE SECOND, then QUICKLY turn back through 90 degrees. Slowly return to full lock and repeat five times. Turn to opposite lock and repeat procedure.
36. Close door.
37. Repeat steps 34 and 35 with the vehicle off the lift and the wheels on the ground.

> ⚠ **Warning:** do not carry out the following procedure on the public highway.

38. Repeat steps 34 and 35 while slowly driving the vehicle in circles to achieve full lock.
39. Retest for fault. If fault rectified, no further action is necessary. If fault still apparent, contact Technical Helpline 1-888-JagDlrs (1-888-524-3577) for further assistance.

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Transmission fluid – Mobil ATF (1 Liter bottle)	JLM 21703	3
Power steering hose O-ring	XR8 29167	1
Power steering hose O-ring	XR8 29168	1

Warranty Information:

Description	SRO	Time	Causal Part Number
Drain, re-fill and bleed power steering system	57.91.29	1.1 hrs.	JLM 21703

JAGUAR	XJ range	DATE 08/03	XJ303-S712

SERVICE **TECHNICAL BULLETIN**

Coolant Hose – Incorrect Routing – Service Action S 712

MODEL	2004 MY XJR
VIN	Specific VINs

Issue:

In-house quality inspections have established that on some 2004 MY XJ Range supercharged vehicles listed in this bulletin, the coolant hose from the thermostat housing to the auxiliary coolant pump may have been incorrectly routed in production, potentially causing the hose to touch the supercharger drive belt and wear through.

Action:

Affected vehicles (see VIN list) should have the coolant hose inspected for the correct routing/damage. Should damage to the coolant hose be evident, the coolant hose must be replaced.

This Service Action should be carried out prior to handover to the customer.

WORKSHOP PROCEDURE

1. Open hood.
2. Install fender protection covers.

COOLANT HOSE ROUTING

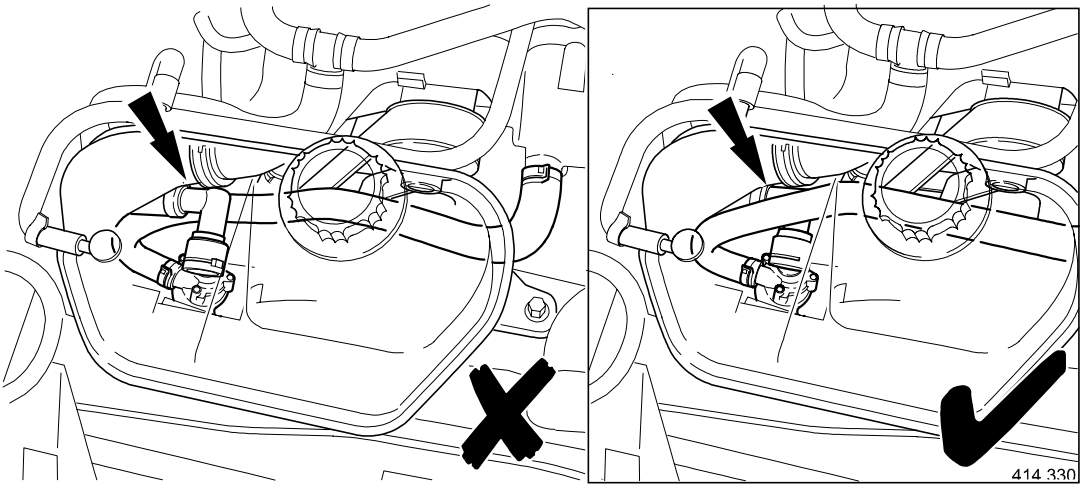

ILLUSTRATION 1

3. Check for correct/incorrect routing of hose - Illustration 1. If the hose routing is correct, as shown in Illustration 1 and identified with a check mark, no further action is required. If the hose routing is incorrect, as shown in Illustration 1 and identified with an X, continue with the workshop procedure from step 4.

Warning: Never remove the coolant pressure cap under any circumstances while the engine is operating. Failure to follow this instruction may result in personal injury.

To avoid having scalding hot coolant or steam blow out of the cooling system, use extreme care when removing the coolant pressure cap from a hot cooling system. Wait until the engine has cooled, then wrap a thick cloth around the coolant pressure cap and turn it slowly until the pressure begins to release. Step back while the pressure is released from the system. When certain all the pressure has been released (still with a cloth) turn and remove the coolant pressure cap from the coolant expansion tank. Failure to follow these instructions may result in personal injury.

Warning: To avoid the possibility of personal injury, do not operate the engine with the hood open until the fan blades have been examined for cracks and separation. Failure to follow this instruction may result in personal injury.

Warning: Remove fuse 14 from the engine compartment fuse box prior to performing any under hood service in the area of the cooling fan when the engine is hot, since the cooling fan motor could operate if the engine has been switched off. Failure to follow this instruction may result in personal injury.

Caution: The engine cooling system must be maintained with the correct concentration and type of anti-freeze solution to prevent corrosion and frost damage.

Caution: Never remove the coolant pressure cap under any circumstances while the engine is operating. Failure to follow this instruction may result in damage to the engine.

4. Remove coolant reservoir cap.
5. Raise the vehicle on a ramp.
6. Remove radiator splash shield. See Workshop Manual JTIS CD ROM, section: 501-02.
7. Remove air deflector. See Workshop Manual JTIS CD ROM, section: 501-02.
8. Remove the radiator lower cowl.
9. Drain coolant from the radiator into a clean container for reuse.
10. Reinstall radiator lower cowl.
11. Reinstall air deflector. See Workshop Manual JTIS CD ROM, section: 501-02.
12. Reinstall radiator splash shield. See Workshop Manual JTIS CD ROM, section: 501-02.
13. Lower vehicle on ramp.
14. Remove engine cover.
15. Remove air filter outlet tube. See Workshop Manual JTIS CD ROM, section: 303-12B.
16. Check incorrectly routed hose for damage – if damage is evident, proceed with step 36 to 59 of this workshop procedure. If no damage is evident continue with this procedure to step 35.
17. Undo and remove coolant reservoir securing bolt.
18. Displace coolant reservoir and reposition for access.
19. Reposition incorrectly routed hose securing clip along the hose at the thermostat housing end.
20. Place absorbent cloth under thermostat housing.

> **Note:** It is important that the drive belts or pulleys do not come into contact with any coolant.

21. Disconnect the hose from the thermostat housing stub pipe.
22. Install suitable tight fitting blanking plugs to the hose and stub pipe.
23. Reroute hose. Illustration 2.
24. Displace and remove blanking plugs from the hose and stub pipe.
25. Reconnect hose to stub pipe.
26. Remove absorbent cloth from under thermostat housing stub pipe.
27. Reposition securing clip along hose at thermostat housing end.
28. Reposition and align coolant reservoir to the correct position.
29. Install and fully tighten coolant reservoir securing bolt.
30. Reinstall air filter outlet tube. See Workshop Manual JTIS CD ROM, section: 303-12B.
31. Reinstall engine cover.
32. Refill coolant system with original coolant. See Workshop Manual JTIS CD ROM, section: 303-03B.

Note: Torque figure for expansion tank bleed renew should be 3 Nm.

33. Install and fully tighten coolant reservoir filler cap.
34. Remove fender protection covers.
35. Close hood.
36. Remove expansion tank for access to damage hose. See Workshop Manual JTIS CD ROM, section: 303-03A.
37. Reposition incorrectly routed hose securing the clip along the hose at the thermostat housing end.
38. Place absorbent cloth under thermostat housing.

Note: It is important that the drive belts or pulleys do not come into contact with any coolant.

39. Disconnect the hose from the thermostat housing stub pipe.
40. Install suitable tight fitting blanking plugs to the hose and stub pipe.
41. Reposition hose securing clip at auxiliary coolant pump end.
42. Place absorbent cloth around the pump.

Note: It is important that the drive belts or pulleys do not come into contact with any coolant.

43. Disconnect the hose from the pump and install suitable tight fitting blanking plug to the hose.
44. Remove the hose from the vehicle.

ROUTING NEW HOSE

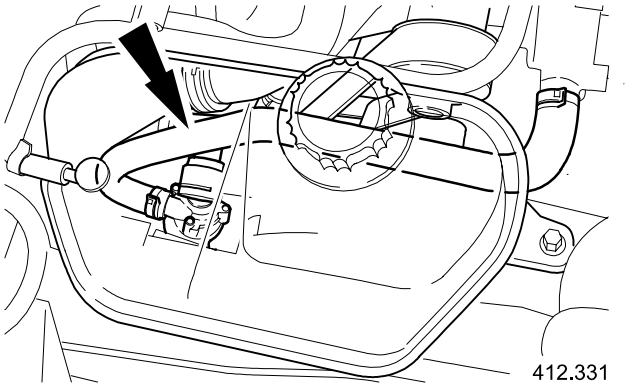

ILLUSTRATION 2

45. Route new hose. Illustration 2.
46. Align and push fully home new hose to pump.
47. Reposition securing clip along hose at pump end.

48. Remove absorbent cloth from around the pump.
49. Displace and remove the blanking plug from the thermostat housing stub pipe.
50. Reconnect hose to stub pipe.
51. Remove absorbent cloth from under thermostat housing stub pipe.
52. Reposition securing clip along hose at thermostat housing end.
53. Reinstall coolant expansion tank. See Workshop Manual JTIS CD ROM, section: 303-03A.
54. Reinstall air filter outlet tube. See Workshop Manual JTIS CD ROM, section: 303-12B.
55. Reinstall engine cover.
56. Refill coolant system with original coolant. See Workshop Manual JTIS CD ROM, section: 303-03B. Note: Torque figure for expansion tank bleed renew should be 3 Nm.
57. Install and fully tighten coolant reservoir filler cap.
58. Remove fender protection covers.
59. Close hood.

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Coolant Hose	C2C 12952	1

Warranty Information:

Warranty claims should be submitted quoting program code S712 together with the relevant option code from the table below. This will result in payment of the appropriate labour time and any parts, as necessary.

The options for the drive in/drive out allowance should only be claimed if the vehicle is brought back into the workshop for this action alone to be undertaken.

The SROs and parts listed are included for information only. There will be no requirement to enter the SROs or parts onto the claim.

Program Code	Option	Description	SRO	Time	Part Number	Part Description	Qty
S712	A	Inspect coolant hose for routing and damage – no further action required	10.10.99	0.2 hrs.			
S712	K	Inspect coolant hose for routing and damage – no further action required	10.10.99	0.2 hrs.			
		Drive in/drive out	10.10.10	0.1 hrs.			
S712	B	Inspect coolant hose – no damage evident, re-routing required	26.91.12	2.0 hrs.			
S712	C	Inspect coolant hose – no damage evident, re-routing required	26.91.12	2.0 hrs.			
		Drive in/drive out	10.10.10	0.1 hrs.			
S712	D	Inspect, replace, and re-route coolant hose	26.91.12/01	2.2 hrs.	Coolant Hose	C2C 12952	1
S712	E	Inspect, replace, and re-route coolant hose	26.91.12/01	2.2 hrs.	Coolant Hose	C2C 12952	1
		Drive in/Drive out	10.10.10	0.1 hrs.			

NOTE: Always perform a DDW claim search first to determine whether this service action has been performed on this vehicle. The warranty selection under the vehicle inquiry will give a listing of all claims against the vehicle. If this service action number appears in the program code field, do not perform this service action.

AFFECTED VEHICLES

G09748	D S - 5675
G09892	D S - 5664
G09742	D S - 5397
G09883	D S - 5684
G09622	D S - 0617
G09808	D S - 0222
G09832	D S - 5629
G09898	D S - 5706
G10200	D S - 5775
G09873	D S - 5742
G10204	D S - 5706
G09877	D S - 5725
G09682	D S - 5614
G09613	D S - 5745

JAGUAR	XJ range	DATE 08/04 Amended 12/04	XJ307-05

SERVICE **TECHNICAL BULLETIN**

Squeal/Squeak Noise During Acceleration – Flush And Replace ZF Transmission Fluid – Repair Procedure

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Remove and destroy Bulletin XT307-05, dated 08/04.
Replace with this Bulletin.
Revisions are marked with a bar and in bold text.

Issue:

Some 2004 MY-ON XJ range vehicles may exhibit a squeal or squeak noise heard during shifts while accelerating. To solve this concern, the transmission needs to be flushed and the fluid replaced with a new specification fluid.

Action:

In case of a verified customer complaint of the above condition, flush the transmission and replace the fluid as outlined below.

Note: Please inform the customer that the squeal or squeak noise may persist until the vehicle has covered at least 20 miles. This distance is required to allow the transmission fluid to flow through all areas of the transmission.

WORKSHOP PROCEDURE

1. Raise vehicle on lift.
2. Place a clean drain container under the transmission.
3. Remove the transmission drain plug and allow fluid to drain.
4. Clean, install and tighten transmission drain plug to 8 Nm.
5. Transfer transmission fluid from container to a suitable measuring jug, measure quantity and discard transmission fluid.
6. Clean the measuring jug.
7. Measure the equivalent quantity of new transmission fluid into the clean measuring jug.
8. Remove filler plug using special tool 307-452.
9. Using a clean syringe, fill the transmission with some of the measured fluid to filler plug level.
10. Turn ignition ON.

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11. Ensure the selector lever is in P and the parking brake is applied.
12. Start the engine.
13. Immediately fill the transmission with remainder of the measured new transmission fluid.
14. Install and tighten transmission filler plug.
15. Apply footbrake.
16. Shift through selector lever range positions from P to R, N and D and back to N.
17. With the selector lever in N, run the engine at 1500 rpm for one to two minutes.
18. Return selector lever to P.
19. Release footbrake.
20. Switch off the engine.
21. With the drain container under the transmission, remove the transmission drain plug.
22. Allow transmission fluid to drain.
23. Remove and discard the transmission drain plug seal.
24. Clean the transmission drain plug.
25. Place a new seal on the transmission drain plug.
26. Install and tighten transmission drain plug to 8 Nm.
27. Clean excess fluid from the transmission fluid pan.
28. Transfer the used transmission fluid from the container to the measuring jug. After measuring the quantity, discard the used transmission fluid.
29. Clean the measuring jug.
30. Measure an equivalent quantity plus 0.5 Liter of new transmission fluid into the clean measuring jug.
31. Remove the filler plug using special tool 307-452.
32. Use a clean syringe to fill the transmission with some of the measured quantity of new fluid up to the level of the filler plug.

> **Note:** Ensure that the WDS is loaded with software release JTP 759/**35** or later.

33. Position the WDS alongside vehicle, switch Portable Test Unit (PTU) ON and allow software to load.
34. Connect the PTU to the vehicle's data link connector (DLC).
35. Enter the VIN and navigate to content model screen.
36. Select 'Transmission System'.
37. Press the datalogger icon tab at the top of the screen.
38. Select and view 'Transmission Oil Temperature' signal. Ensure the parking brake is on, with P selected and start the engine as instructed.
39 Press check mark to monitor temperature.

40. Immediately add in the remainder of measured fluid amount up to the filler hole level (fluid running from hole).
41. Install and tighten the transmission filler plug.
42. Apply footbrake.
43. Shift through the selector lever positions from P to R, N and D and back to N.
44. With the selector lever in N, run the engine at 1500 rpm for one to two minutes.
45. Return selector lever to P.
46. Release footbrake.
47. Allow transmission fluid temperature to reach 37°C.
48. Remove and discard transmission filler plug.
49. Allow the transmission fluid to drain from the filler plug hole until it becomes a slow trickle.
50. Install the new transmission filler plug using special tool 307-452 and tighten (see Workshop Manual section: 307-01, General Procedures, Transmission Fluid Level Check).

> **Note:** Make sure the transmission fluid temperature has not exceeded 50°C. If the transmission fluid has exceeded 50°C, install the transmission filler plug and allow the transmission to cool and repeat the complete level check.

51. Clean the fluid residue from transmission.
52. Remove drain container.
53. Switch the ignition OFF.
54. Switch OFF the PTU, disconnect from vehicle and return the WDS to original location.

Global Technical Reference (GTR) Workshop Manual Information:

Dealer access: https://hub.franchise.jaguar.com

Internet access: http://www.jaguartechinfo.com

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Transmission fluid	C2C 8432	6
Transmission drain plug seal	C2C 6730	1
Transmission filler plug	C2C 6729	1

Warranty Information:

Description	SRO	Time	Causal Part Number
Transmission flush procedure	44.91.30	1.2 hrs.	C2C 8432

JAGUAR	XJ range	DATE 06/03 Amended 06/04	XJ307-02

SERVICE **TECHNICAL BULLETIN**

Driveline Clunk/Knock When Downshifting – ZF 6HP26 Automatic Transmission – Repair Procedure

MODEL	2004 MY XJ range
VIN	Refer to text

MODEL	YEAR	VIN
XJR	2004	G00442 - G23484
XJ	2004	G00442 - G22915

Remove and destroy Bulletin XJ307-02, dated 06/03.
Replace with this Bulletin.
Revisions are marked with a bar and in **bold text**.

Issue:

Owners of some 2004 MYXJ range vehicles, equipped with the ZF 6HP26 automatic transmission, may complain of a driveline clunk/knock when changing from reverse to drive, or while downshifting from fifth to fourth or second to first when the vehicle is slowing.

A modified transmission output shaft flange and seal has been released to address this concern.

Action:

in case of a verified customer complaint of the above condition, follow the workshop procedure outlined below.

WORKSHOP PROCEDURE

1. **Install a new automatic transmission extension housing seal and output flange (see Workshop Manual, section: 307-01, SRO 44.20.18).**

   Note: When removing the transmission output shaft flange, if an O-ring is installed behind the nut, the O-ring should be removed and discarded. It is only required for testing during initial build of the transmission and a replacement is not required.

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Global Technical Reference (GTR) Workshop Manual Information:

Dealer Access: https://hub.franchise.jaguar.com
Internet access: http://www.jaguartechinfo.com

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Extension housing seal	**C2C 6719**	**1**
Locknut	**C2C 6725**	**1**
Output shaft flange	**C2C 25737**	**1**

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Install a new automatic transmission extension housing seal and output shaft flange	**44.20.18**	**2.3 hrs.**	**C2C 12374**

JAGUAR	XJ range	DATE 08/03	XJ307-01

SERVICE **TECHNICAL BULLETIN**

MIL Illumination – DTC P0741 – Replace Torque Converter

MODEL	2004 MY XJ8 2004 MY XJR
VIN	G00442-G01790 G00442-G05142

Issue:

Some of the above vehicles may exhibit the MIL illuminating with Diagnostic Trouble Code (DTC) P0741 (Torque Converter Clutch Stuck Open) logged in the Transmission Control Module (TCM) and Engine Control Module (ECM).

It has been found that there is a fault with the clutch lining of the torque converter. A modified torque converter is now available to resolve the concern.

Action:

In case of a verified customer complaint of the above condition, replace the torque converter as outlined below.

WORKSHOP PROCEDURE

1. Remove the automatic transmission assembly (see Workshop Manual, JTIS CD ROM, section: 307-01, SRO 44.20.01).
2. Place a suitable drain tray under the bell housing end of the transmission.
3. Install torque converter lifting handles (special tool number 307-139) on torque converter.
4. Displace and remove the torque converter from the transmission and place in drain tray.
5. Remove the torque converter lifting handles (special tool number 307-139) from the torque converter.
6. Install torque converter lifting handles (special tool number 307-139) to the new torque converter.

> **Note:** Clean excess oil from transmission using a suitable cloth.

7. Install and align the torque converter onto the input shaft and align onto the oil pump drive.
8. Remove the torque converter lifting handles (special tool number 307-139) from the new torque converter.
9. Remove drain tray.

10. Install the automatic transmission assembly (see Workshop Manual, JTIS CD ROM, section: 307-01, SRO 44.20.01).

> **Note:** For this Technical Bulletin there is no requirement to flush or renew the transmission cooler and tubes.

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Torque converter - 4.2L V8 N/A	C2C 6703	1
Torque converter - 4.2L V8 SC	C2C 6704	1
O-rings	C2C 6712	4
Transmission oil	C2C 8432	5

Warranty Information:

Model	VIN Range
2004 MY XJ8	4SG00442-4SG01790
2004 MY XJR	4TG00442-4TG05142

Description	SRO	Time	Causal Part Number
Install new torque converter - 4.2L V8 N/A	44.17.07	5.4 hrs.	C2S 6704
Install new torque converter - 4.2L V8 SC	44.17.07	5.2 hrs.	C2S 6704

JAGUAR	XJ range	DATE 04/04 Amended 07/04	XJ310-01

SERVICE **TECHNICAL BULLETIN**

Erratic Fuel Gauge Reading – Fuel Tank Sender – Repair Procedure

MODEL	2004 MY XJ range
VIN	XJ G00421-G28859 XJR G00421-ON

Remove and destroy Bulletin XJ310-01, dated 4/04.
Replace with this Bulletin.
Revisions are marked with a bar and in **bold text**.

Issue:

On some 2004 MY XJ range vehicles within the above VIN range, customers may express concern that the fuel gauge fluctuates, reads erratically or that the low fuel light is on soon after filling the fuel tank. This bulletin outlines a process to determine if there is a fault with the fuel tank senders.

Action:

In case of a verified customer complaint of the above condition on a 2004 MY XJ range vehicle within the above VIN range, follow the workshop procedure outlined below.

WORKSHOP PROCEDURE

1. Open driver's door.
2. Use Worldwide Diagnostic System (WDS) to check for DTCs B1202, B1204, B2627, B2628 stored in the instrument cluster and Rear Electronic Module (REM).

> **Note:** If any of these DTCs are stored, carry out the associated diagnostic routine and claim as a separate Warranty Claim. Then clear DTCs using WDS.

3. Place instrument cluster into test mode as follows: Press trip button in and hold, turn the ignition 'ON', release the trip button between five and eight seconds after ignition is switched 'ON'.
4. Scroll to RAW1 signal displayed on message center by repeatedly pressing the trip button.
5. Rock vehicle and view reading. A variation in the reading should be seen.

> **Note:** A good reading should be between 27 and 240. If 255 is displayed at any time this indicates an open circuit.

6. Scroll to RAW2 signal displayed on message center by pressing the trip button.

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7. Rock vehicle and view reading. A variation in the reading should be seen.

> **Note:** A good reading should be between 27 and 240. If 255 is displayed at any time this indicates an open circuit.

8. If readouts show faulty sensors, replace both the fuel pump module and the fuel transfer pump to bring the vehicle to the latest specification.

> **Note: A new gasket must be installed when replacing the fuel pump module(s) and on N/A vehicles the fuel transfer pump.**

9. If readouts are as expected, remove fuel pump module and fuel transfer pump. Refer to see Workshop Manual, section: 310-01, SRO 19.45.08 and 19.45.21.
10. Place fuel pump module on a clean workbench.
11. Attach a suitable Digital Multi Meter (DMM) (set DMM to resistance/continuity) to sender unit pins.

> **Note:** Use adaptors JT006 from the WDS adaptor kit 3548-1358-00 to reduce the possibility of damage to the pins.

12. Slowly sweep the float arm across the full range of the sender to check for open circuit.

> **Note:** The readout should gradually increase from 15 ohms to 160 ohms. If high resistance is displayed at any time this indicates an open circuit.

13. Place the fuel transfer pump (NA) or second fuel pump module (SC) on to a clean workbench.
14. Attach a suitable DMM (set DMM to resistance/continuity) to sender unit pins.

> **Note:** Use adaptors JT006 from the WDS adaptor kit 3548-1358-00 to reduce the possibility of damage to the pins.

15. Slowly sweep the float arm across the full range of the sender to check for open circuit.

> **Note:** The readout should gradually increase from 15 ohms to 160 ohms. If high resistance is displayed at any time this indicates an open circuit.

16. If there is a fault with the sender track resistance, replace both the fuel pump module(s) and the fuel transfer pump (NA) to bring the vehicle to the latest specification.

> **Note: A new gasket must be installed when replacing the fuel pump module(s) and on N/A vehicles the fuel transfer pump.**

17. If the track resistance is OK, reinstall the fuel pump module and fuel transfer pump, and ensure that there is a good connection at the electrical connections.
Refer to see Workshop Manual, section: 310-01, SRO 19.45.08 and 19.45.21.

Note: A new gasket must be installed when replacing the fuel pump module(s) and on N/A vehicles the fuel transfer pump.

18. Close driver's door.

Global Technical Reference (GTR):

Dealer Access: https://hub.franchise.jaguar.com
Internet Access: http://www.jaguartechinfo.com

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Fuel transfer pump (N/A) - VIN G00421-G28859	C2C 24163	1
Fuel pump module (N/A) - VIN G00421-G28859	C2C 24164	1
Fuel pump module (left-hand side SC) - VIN G00421-G27200	C2C 27256	1
Fuel pump module (right-hand side SC) - VIN G00421-G27200	C2C 26898	1
Fuel pump module (left-hand side SC) - VIN G27201-ON	C2C 24166	1
Fuel pump module (right-hand side SC) - VIN G27201-ON	C2C 24165	1
Gasket - All	XR8 5049	2

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Erratic fuel gauge reading service fix (N/A)	88.91.14	2.4 hrs.	C2C 24164
Erratic fuel gauge reading service fix (SC)	88.91.14	2.4 hrs.	C2C 27256

JAGUAR	XJ range	DATE 05/04	XJ413-01

SERVICE **TECHNICAL BULLETIN**

Front Parking Aid Operating With No Obstruction Present – Operating Characteristics – Revised Sensor

MODEL	2004 MY XJ range
VIN	G00001-G18389

Issue:

On occasion, the parking aid sensors may sound a proximity warning when not expected. This bulletin provides some background information on the operating characteristics of the parking aid system.

SYSTEM OPERATION

The 4 sensors, front or rear depending on which is active, transmit an ultrasonic signal. All 4 sensors then wait for that signal to be returned. If any of the 4 sensors receive a return signal, the park aid module will operate the warning sounder. This return signal has to be sent directly back to the sensor in the same plane as the outward signal for the warning to operate.

FRONT PARKING AID

The front parking aid sensors are activated when a forward range is selected and the vehicle speed is below 9 mph (15 km/h). The system is deactivated when the vehicle speed exceeds 9 mph (15 km/h). The system is reactivated when the vehicle speed falls below 6 mph (10 km/h). The front sensors will detect an object up to a range of 32 inches (0.8 m) along the width if the vehicle and 24 inches (0.6 m) at the corners. The front parking aid sensors are also activated when reverse gear is selected. Front parking aid can be deactivated by operating the cancellation switch located in the roof console.

Note: This also deactivates the rear parking aid sensors.

REVERSE PARKING AID

The reverse parking aid sensors are activated when reverse gear is selected. The rear sensors will detect an object up to a range of 72 inches (1.8 m) along the width of the vehicle and 24 inches (0.6 m) at the corners.

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DIAGNOSTICS

When the ignition is turned to position II, the system carries out a self-check. If a fault is detected the control module will generate a fault code, a continuous warning tone will be emitted for 3.5 seconds and the system will be deactivated. Therefore unless a fault code is generated and the 3.5 sec warning heard, it should be assumed that the system is operating correctly.

SPURIOUS WARNINGS

There are some conditions that will activate the system when there is no obvious obstruction. If the vehicle is moving on loose gravel, which has a totally random surface, the sensor could receive a return signal and operate the warning. It is known that anything that emits sound waves at a frequency between 15-150 kHz may affect the sensors. Known influences include fire engine klaxons, pneumatic tools, air brakes, high performance motorcycle/auto engine exhausts. Any of these can cause the warning sounder to be activated. In harsh weather conditions, such as very heavy rainfall, the volume of water passing over the sensor can cause it to operate.

This will also happen if the sensor is covered by ice, frost or grime buildup. In none of these circumstances is there anything wrong with the system.

CONTINUOUS OPERATION OF THE FRONT SENSORS

Some markets had an issue where the front parking aid sensors operated all of the time. This cause was found to be the front inner sensors detecting the license plate bracket (plinth). This affected vehicles between VINs G00442 & G18389. In North America modified brackets were put into the vehicles at the port of entry.

The final fix, for the issue with the license plate bracket, was the introduction of a new inner sensor, part number C2C 21643XXX, introduced at VIN G18389.

When installing a license plate bracket (plinth), center the bracket between the front parking aid sensors.

> **Note:** Do not use any other datum points, such as the grille, to align the bracket.

To find the center line of the front spoiler on cars fitted with front parking aid sensors, measure between the two center sensors.

Align the top edge of the bracket 15 mm away from the bumper feature.

Action:

Should a customer express concern, a new modified front inner parking aid sensor should be installed in place of the inner sensor giving the proximity warning. Refer to Workshop Manual, section: 413-13, SRO 86.62.01.

Global Technical Reference (GTR):

Dealer Access: https://hub.franchise.jaguar.com
Internet access: http://www.jaguartechinfo.com

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Front parking aid sensor	C2C 21643XXX	1

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Note: The front parking aid sensor is supplied primed. For painting allowance please follow the Warranty Policy and Procedure Manual.

Description	SRO	Time	Causal Part Number
Install a new front parking aid sensor	86.62.33	0.9 hrs.	C2C 21643

JAGUAR	XJ range	DATE 09/04	XJ413-02

SERVICE **TECHNICAL BULLETIN**

Multiple Warnings On Instrument Cluster – Poor Pin Connections – Check & Repair Pins

MODEL	2004 MY XJ range
VIN	G00001-G25490

Issue:

Some 2004 XJ range vehicles, within the above VIN range, may exhibit multiple warnings on the instrument cluster due to poor male/female electrical pin connections.

The following symptons will result:

- All the warning lights are illuminated on the instrument cluster.
- Tachometer, speedometer and coolant temperature gauges all drop to zero.
- Transmission goes into limp home mode.
- Power steering defaults to the heavy setting.
- Air suspension goes to hard setting.
- All of the warning messages scroll through on the instrument cluster message center.

> **Note:** The vehicle can still continue to be driven, however, if the condition still exists when the engine is switched off, it will not be possible to re-start the engine.

Action:

In case of a verified customer complaint of the above symptoms, follow the workshop procedure outlined below.

WORKSHOP PROCEDURE

1. Open driver door.
2. Power driver seat to the rear most position.
3. Disconnect battery (see Workshop Manual, section: 414-01).
4. Open hood and install fender protector covers.

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ELECTRICAL CONNECTOR EC030 PINS 11 AND 15

5. Disconnect the Anti-lock Braking System (ABS)/Dynamic Stability Control (DSC) module electrical connector EC030 (black 47 way) (Illustration 1).

ABS/DSC CONNECTOR EC030

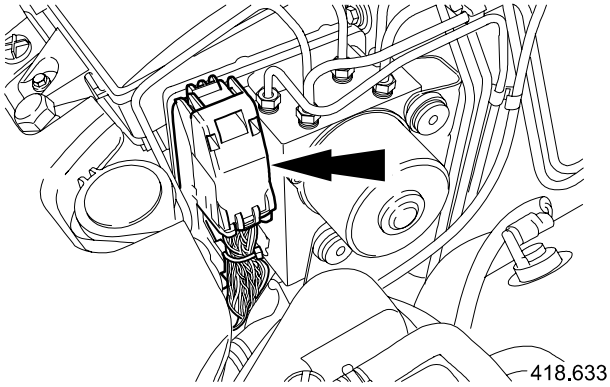


ILLUSTRATION 1

6. Use a male pin 418-411-47 from the harness repair kit, to check the integrity of pins 11 and 15 (Illustration 2).

EC030 PINS 11 AND 15

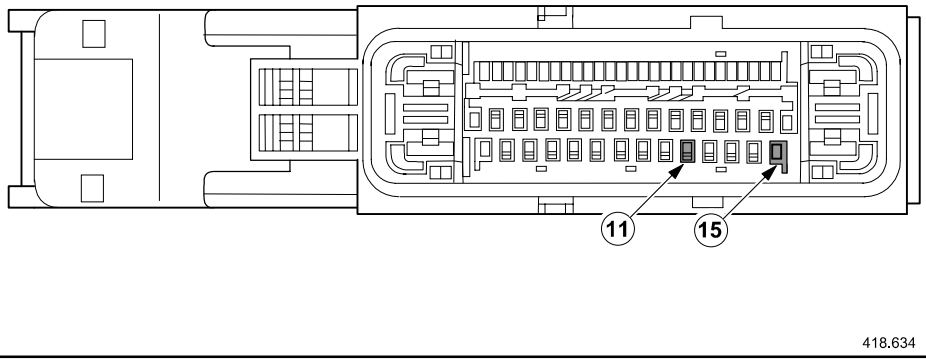


ILLUSTRATION 2

Note: The male to female electrical connection must be very firm, and be felt for the full length of the electrical connector. If there is initial resistance then the pin slips freely into the female pin, replace the female pin. If there is any doubt replace the female pin. Repeat this check with the new pin to verify a proper fit.

If pins are OK, continue with inspection of electrical connector IP055, if not, replace any faulty pin(s) using preterminated end **418-411-74** as follows:

REPLACING FAULTY PINS

1. Remove the front power distribution box securing bolts.
2. Disconnect the front power distribution box electrical connectors.
3. Remove the nut securing the main battery cable to the front power distribution box and reposition the main battery power cable.

4. Remove the nut securing the generator supply cable to the front power distribution box and reposition the generator supply cable.
5. Remove the front power distribution box from the vehicle.
6. Re-route the ABS/DSC harness for access.
7. Cut, remove and discard the cable tie securing the harness to the electrical connector.
8. Remove the anti-back-out device from the electrical connector.
9. Use the special tool ‘A’ from the harness repair kit to displace the affected pin(s) from the electrical connector.
10. Unwind the affected cable from the Controller Area Network (CAN) bus second cable.
11. Cut back affected cable to the required length to facilitate repair.
12. Strip back outer casing of the cut cable 6 to 7 mm.
13. Crimp butt-splice connector 418-107 from the harness repair kit to the prepared cable.
14. Strip back outer casing from the new pre-terminated end **418-411-74**.
15. Crimp the new pre-terminated end to the butt-splice connector.
16. Slide heat shrink tube 418-104 from the harness repair kit over the butt-splice connector.
17. Using a suitable heat source, shrink the tube over the butt-splice connector.
18. Insert the new pin(s) into the electrical connector.
19. Insert the anti-back-out device.
20. Secure the harness to the electrical connector with a cable tie.
21. Cut the protruding end of the cable tie and discard.
22. Re-route the ABS/DSC harness and connect the electrical connector.
23. Install the generator supply cable to the front power distribution box, install and tighten the generator supply cable securing nut.
24. Install the main battery power cable to the front power distribution box, install and tighten the main battery cable securing nut.
26. Install the front power distribution box electrical connectors.
27. Install and tighten the front power distribution box securing bolts.

ELECTRICAL CONNECTOR IP055 PINS 21 AND 22

1. Remove the right hand side scuff plate trim panel (see Workshop Manual, section: 501-05).
2. Remove the right hand side A-post lower trim pad.

3. Displace the intermediate connector IP055 (black 22 way) from the mounting tang (Illustration 3).

INTERMEDIATE CONNECTOR IP055

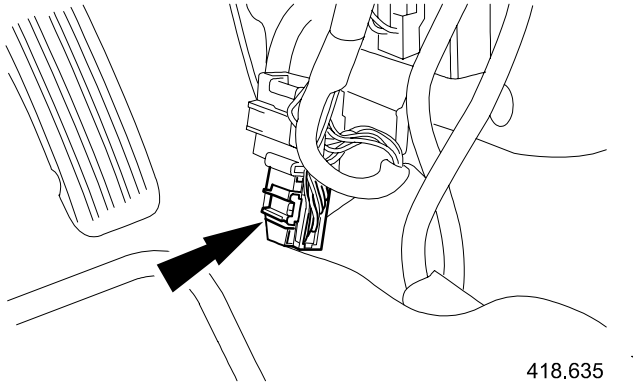


ILLUSTRATION 3

4. Disconnect the intermediate connector IP055.
5. Position harness for access.
6. Use a male pin 418-411-47 from the harness repair kit, check the integrity of pin 21 and 22 (Illustration 4).

IP055 PINS 21 AND 22

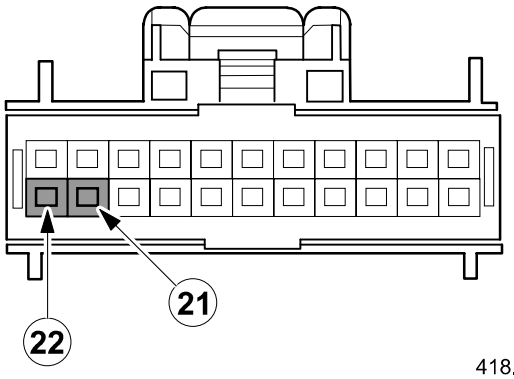


ILLUSTRATION 4

Note: The male to female electrical connection must be firm, and be felt for the full length of the electrical connector. If there is initial resistance, then the pin slips freely into the female pin, replace the female pin. If there is any doubt replace the female pin. Repeat this check with the new pin to verify a proper fit.

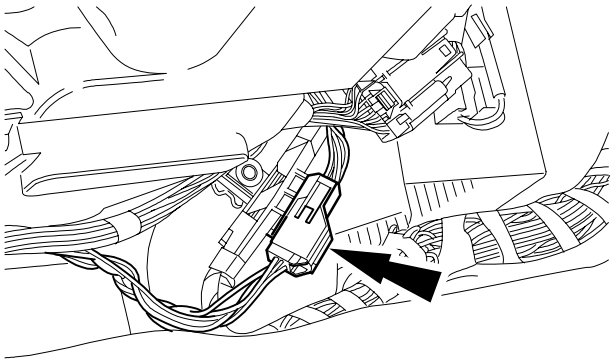
7. If pins require replacing, strip back the harness tape to adequate length to facilitate repair. If not, continue with step 20 of this procecedure
8. Remove the anti-back-out device from the electrical connector.
9. Displace affected pin(s) from the electrical connector using special tool ‘A’ from the harness repair kit.
10. Unwind the affected cable from the Controller Area Network (CAN) bus second cable.
11. Cut back affected cable to the required length to facilitate repair.
12. Strip back outer casing of the cut cable 6 to 7 mm.
13. Crimp butt-splice connector 418-107 from the harness repair kit to the prepared cable.
14. Strip back outer casing from the new pre-terminated end **418-411-45**.
15. Crimp the new pre-terminated end to the butt-splice connector.
16. Slide heat shrink tube 418-104 from the harness repair kit over the butt-splice connector.
17. Using a suitable heat source, shrink the tube over the butt-splice connector.
18. Insert the new pin(s) into the electrical connector.
19. Insert the anti-back-out device.
20. Tape harness to original condition.
21. Connect intermediate connector IP055.
22. Install intermediate connector IP055 to the mounting tang.
23. Install right hand side A-post lower trim pad.
24. Install right hand side scuff plate trim panel (see Workshop Manual section: 501-05). Continue with inspection of connector CR120.

ELECTRICAL CONNECTOR CR120 PINS 3 AND 4

1. Remove securing scrivets to remove lower instrument panel finisher.

2. Disconnect electrical connector CR120 (black 8 way) (Illustration 5).

ELECTRICAL CONNECTOR CR120



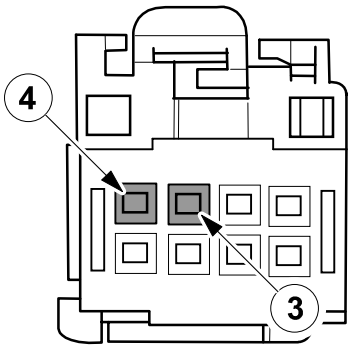
418.640

ILLUSTRATION 5

3. Use a male pin 418-411-47 from the harness repair kit to check the integrity of pin 3 and 4 (Illustration 6).

> **Note:** The male to female electrical connection must be firm, and be felt for the full length of the electrical connector. If there is initial resistance, then the pin slips freely into the female pin, replace the female pin. If there is any doubt replace the female pin. Repeat this check with the new pin to verify a proper fit.

CR120 PINS 3 AND 4



418.637

ILLUSTRATION 6

4. If pins require replacing, strip back the harness tape to adequate length to facilitate repair. If not, continue with step 17 of this procedure.
5. Remove the anti-back-out device from the electrical connector.
6. Displace affected pin(s) from the electrical connector using special tool ‘A’ from the harness repair kit.
7. Unwind the affected cable from the Controller Area Network (CAN) bus second cable.
8. Cut back affected cable to the required length to facilitate repair.

9. Strip back outer casing of the cut cable 6 to 7 mm.
10. Crimp butt-splice connector 418-107 from the harness repair kit to the prepared cable.
11. Strip back outer casing from the new pre-terminated end **418-411-45**.
12. Crimp the new pre-terminated end to the butt-splice connector.
13. Slide heat shrink tube 418-104 from the harness repair kit over the butt-splice connector.
14. Using a suitable heat source, shrink the tube over the butt-splice connector.
15. Insert the new pin(s) into the electrical connector.
16. Insert the anti-back-out device.
17. Tape harness to original condition.
18. Connect electrical connector CR120. Continue with inspection of connector CR119.

ELECTRICAL CONNECTOR CR119 PINS 6 AND 7

1. Disconnect electrical connector CR119 (gray 22 way) (Illustration 7).

ELECTRICAL CONNECTOR CR119

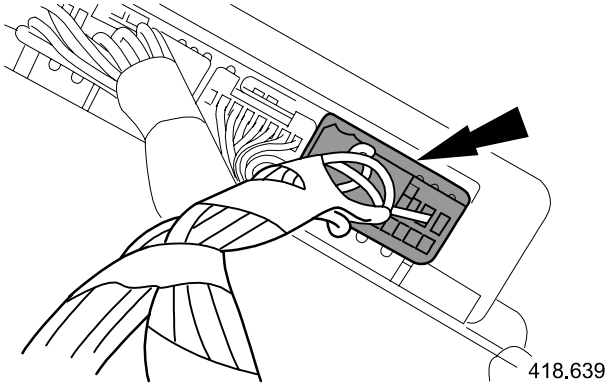


ILLUSTRATION 7

2. Displace electrical harness from mounting point.
3. Align harness for access to electrical connector.

4. Using the male pin 418-411-47 from the harness repair kit, check the integrity of pin 6 and 7 (Illustration 8).

> **Note:** The male to female electrical connection must be firm, and be felt for the full length of the electrical connector. If there is initial resistance then the pin slips freely into the female pin, replace the female pin. If there is any doubt replace the female pin. Repeat this check with the new pin to verify a proper fit.

CR119 PINS 6 AND 7

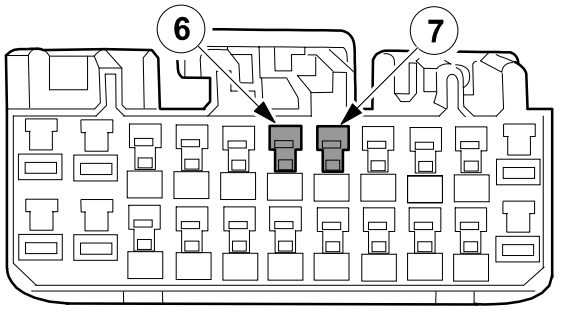


ILLUSTRATION 8

5. If pins require replacing, displace anti-back-out device, strip back the harness tape to adequate length to facilitate repair. If not continue with step 18 of this procedure.
6. Remove the anti-back-out device from the electrical connector.
7. Displace affected pin(s) from the electrical connector using special tool ‘A’ from the harness repair kit.
8. Unwind the affected cable from the Controller Area Network (CAN) bus second cable.
9. Cut back affected cable to the required length to facilitate repair.
10. Strip back outer casing of the cut cable 6 to 7 mm.
11. Crimp butt-splice connector 418-107 from the harness repair kit to the prepared cable.
12. Strip back outer casing from the new pre-terminated end **418-411-75**.
13. Crimp the new pre-terminated end to the butt-splice connector.
14. Slide heat shrink tube 418-104 from the harness repair kit over the butt-splice connector.
15. Using a suitable heat source, shrink the tube over the butt-splice connector.
16. Insert the new pin(s) into the electrical connector.
17. Insert the anti-back-out device.
18. Re-route harness to original position.
19. Secure electrical harness to mounting point.

20. Connect electrical connector CR119.
21. Install driver side lower instrument panel finisher with the securing scrivets.
22. Remove fender protector covers and close hood.
23. Connect battery (see Workshop Manual, section: 414-01).
24. Power driver seat to original position.
25. Close driver door.

Global Technical Reference (GTR) Workshop Manual Information:

Dealer access: https://hub.franchise.jaguar.com
Internet access: http://www.jaguartechinfo.com

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Multiple warnings on instrument cluster service fix	86.93.30	1.6 hrs	C2C 13290

XJ range	DATE 05/03	XJ415-01

SERVICE

TECHNICAL BULLETIN

Loss Of Audio/Incorrect Speaker Operation – Water Damage To Amplifier/Audio Components – Apply Sealer

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

Customer complaints of loss of audio function or incorrect speaker operation caused by water damage to amplifier/audio components due to water ingress into the left hand side of the luggage compartment.

Action:

If a failure has been identified as mentioned in the summary above, follow the workshop procedure outlined below prior to the installation of new amplifier/audio system components.

> **Note:** Replacement of amplifier/audio system components must be carried out as a separate Warranty Claim.

WORKSHOP PROCEDURE

1. Open luggage compartment lid.
2. Remove luggage compartment floor carpet.
3. Remove luggage compartment left hand side liner.
4. Using suitable waterproof cover, protect the amplifier/audio components during the water test.
5. With luggage compartment lid open, carefully pour water into the left hand luggage compartment channel. (See Illustration 1)

> **Note:** Ensure bottom left corner of the heated backlight is tested with water.

PERFORM LEAK TEST

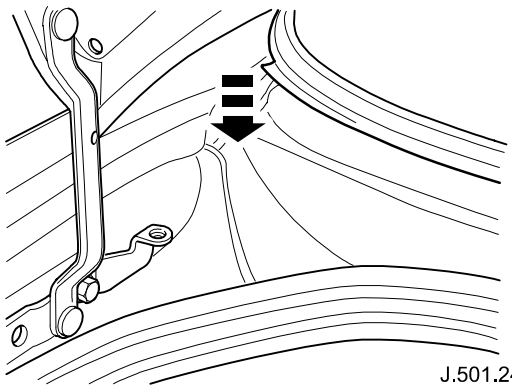


ILLUSTRATION 1

6. Check for water leaks onto the waterproof cover over the amplifier/audio system components.

SEALING SEAM

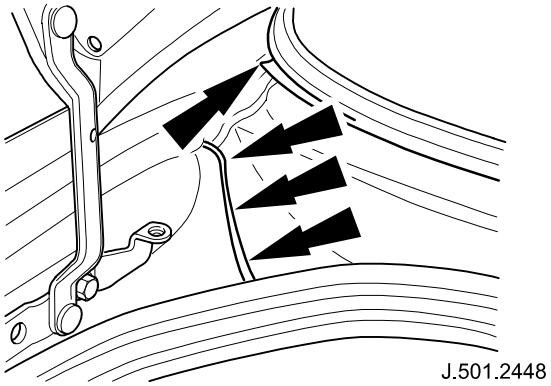


ILLUSTRATION 2

7. If water drips onto the water proof cover, use 3M Super Silicone Clear Sealant – 08661 and seal the seam. (See Illustration 2)

> **Note:** Pump sealant into gap at the left hand side bottom corner of the heated backlight to fill the gap.

8. Remove excess sealant from the paint.

SEALING HINGE BOLTS

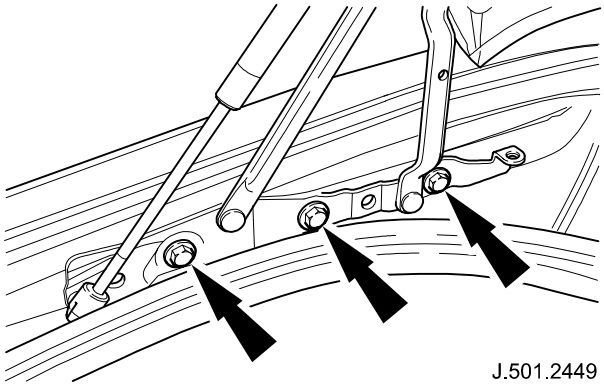


ILLUSTRATION 3

9. Remove one of the bolts securing the left-hand side luggage compartment lid hinge to the body. (See Illustration 3)

> **Note:** Remove the bolts securing the luggage compartment lid hinge to the body one at a time to avoid disturbing hinge alignment.

10. Apply sealant into luggage compartment lid hinge to body securing bolt hole.

11. Install and fully tighten left hand side luggage compartment lid hinge to body securing bolt to 18 Nm.
12. Carry out steps 9 to 11 for the two remaining left hand side luggage compartment lid hinge to body securing bolts.
13. Remove and discard waterproof cover from amplifier/audio system components.
14. Install luggage compartment left hand side liner.
15. Install luggage compartment floor carpet.
16. Close luggage compartment lid.

Parts Information:

3M Super Silicone Sealant - Clear 08661 is considered a workshop consumable and as such may not be claimed.

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Carry out luggage compartment water test and seal	76.94.22	0.3 hrs.	C2C 7477

XJ range	DATE 02/04	XJ419-01

SERVICE **TECHNICAL BULLETIN**

Telematics Issues – Check For Latest Software – Update Procedure

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

When telematic issues are experienced, it is important to ensure that the latest level operating system software has been installed before replacing any hardware.

Action:

Should a customer express concern, update the telematics operating system software (if necessary) following the workshop procedure outlined below.

> ⚠ **Caution:** Do not load software that is older than the currently loaded software into a Navigation Module since this can permanently damage the Navigation Module.

> **Note:** The software level can be checked by pressing and holding the 'Phone' and 'Menu' keys down at the same time for approximately 5 seconds - A 'PIN Entry' screen will be displayed, enter code 917 and press 'ENTER'. The software should be version 8.00 or later.

> **Note:** Obtain and record the 4-digit security code number from the Security Radio Code card for the Workshop Procedure.

WORKSHOP PROCEDURE

Automatic Telematics Software Updating

> **Note:** All customer stored locations will be removed when the software is updated (memory points, avoid areas, recent destinations, home positions etc).

1. Open the luggage compartment lid.
2. Turn the ignition key to the accessory position.
3. Remove the map DVD if currently installed.
4. Insert the latest level operating system software CD-ROM.

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5. The system should automatically update from the inserted disc.

> **Note:** If the ignition key is turned 'OFF' or the disc is ejected while the software is updating, the unit will lose all software and will display a blank screen. If this happens, leave the system for approximately 20 minutes with the ignition switched 'ON' and the software disc inserted, the system should then recover to complete the update. If the system does not recover the DVD unit will require replacement.

6. When the update is complete the system will display the 'Leaper' screen and then time out to display one of the sub-systems (Air Conditioning, Radio, Navigation or Phone).

> **Note:** The radio PIN entry screen may be displayed first if the radio market setting was changed. At this point enter the 4-digit security code number and the system will function normally. The 4-digit security code number can be found on the Security Radio Code card that came with the vehicle.

7. Remove system software update CD-ROM.
8. Re-insert the map DVD.
9. Turn the ignition key to the 'OFF' position.
10. Close luggage compartment lid.

Warranty Information:

Description	SRO	Time	Causal Part Number
Update of telematics system software	86.92.81	0.2 hrs.	C2C 3365

JAGUAR	XJ range	DATE 10/03	XJ501-04

SERVICE **TECHNICAL BULLETIN**

Intermittent Sticking Of Switches– Upper Center Console – Repair

MODEL	2004 MY XJ range
VIN	G00001-G21479

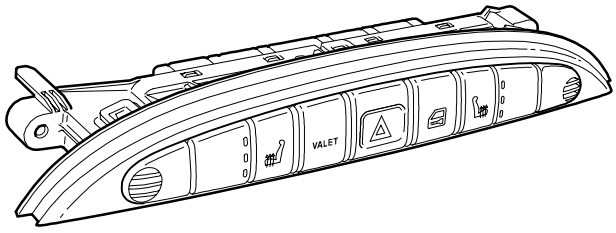
Issue:

On some 2004 MY XJ range vehicles within the above VIN range, customers may experience intermittent sticking of the switch pack in the upper section of the center console.

This condition is caused by excessive pressure applied to the buttons due to contact between the center console and the switch pack bezel.

A new modified switch pack for the upper center console is now available to rectify this concern.

UPPER CENTER CONSOLE SWITCH PACK



J.501.2412

ILLUSTRATION 1

Action:

In case of a verified customer complaint of the above condition on a 2004 MY XJ range vehicle within the above VIN range, replace the switch pack as described below:

REPAIR PROCEDURE

1. Remove the instrument panel console (see Workshop Manual, JTIS CD ROM, section: 501-12, SRO 88.20.34).

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2. Remove the two center console upper switch pack securing screws.
3. Remove the upper switch pack.
4. Install and align the new upper switch pack.
5. Install and tighten the two upper switch pack securing screws.
6. Install the instrument panel console (see Workshop Manual, JTIS CD ROM, section: 501-12, SRO 88.20.34).

Parts Information:

DESCRIPTION	PART NUMBER	QTY
Center console upper switch pack (non heated seats)	C2C 23779	1
Center console upper switch pack (heated seats)	C2C 23780	1

Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Install center console upper switch pack (non-heated seats)	86.65.50	0.5 hrs.	C2C 23779
Install center console upper switch pack (heated seats)	86.65.50	0.5 hrs.	C2C 23780

JAGUAR	XJ range	DATE 11/03	XJ501-05

SERVICE **TECHNICAL BULLETIN**

Loss of Seat Memory – Reprogram DSM or RMM/Recalibrate Seat – Repair Procedure

MODEL	2004 MY XJ range
VIN	G00001-G10854

Issue:

Some 2004 MY XJ range vehicles within the above VIN range, may exhibit a concern regarding loss of seat memory. Depending on the part number suffix of the vehicle's driver seat module (DSM) or rear memory module (RMM), may need to be reconfigured, or the seat recalibrated using the Worldwide Diagnostic System (WDS).

Action:

In case of a customer complaint of the above condition on a 2004 MY XJ vehicle within the above VIN range, follow the workshop procedure outlined below.

> **Note:** The customer should be made aware that any existing memory settings will be lost when a module is reconfigured or replaced.

WORKSHOP PROCEDURE

1. Position WDS alongside vehicle, switch Portable Test Unit (PTU) 'ON' and allow software to load.

   > **Note:** Ensure WDS is loaded with software release JTP 759/25 or later.

2. Connect the WDS to the vehicle using the diagnostic cable.
3. Enter the VIN and navigate to configuration main menu.
4. Select and run 'Vehicle Control Module Identification' in 'Special Applications' menu, to determine the part number suffix of the installed DSM. Continue with the appropriate procedure on the next page.

DSM with AF or CF part number suffix or RMM with BG part number suffix

1. From the configuration main menu, select and run 'Reconfigure Existing Driver's Seat Control Module' application or 'Reconfigure Existing Rear Seat Control Module'.

   > **Note:** Ensure the WDS is connected to the vehicle before attempting to reconfigure the DSM or RMM.

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Note: When reconfiguring an AF or CF level DSM or BG level RMM, the DTC B1940 will be stored in the memory. Ignore this DTC.

3. After reconfiguration of the DSM is complete, switch 'OFF' PTU, disconnect from vehicle and return WDS to original location.

AG or CG part number suffix

1. In 'Set Up & Configuration' select and run 'Seat Calibration'.
2. After calibration is complete, switch 'OFF' PTU, disconnect from vehicle and return WDS to original location.

Warranty Information:

Description	SRO	Time	Causal Part Number
Read driver seat module level and re-configure module using WDS	86.93.25	0.8 hrs.	C2C 13876
Read driver seat module level and re-calibrate seat using WDS	86.93.25/01	0.5 hrs.	C2C 13876
Read rear seat module level and re-configure module using WDS	86.93.22	0.8 hrs.	C2C 13875
Read rear seat module level and re-calibrate seat using WDS	86.93.22/01	0.5 hrs.	C2C 13875

JAGUAR	XJ range	DATE 11/03	XJ501-06

SERVICE **TECHNICAL BULLETIN**

Valet Key Opens Trunk – Incorrect Lock Cylinder – Repair Procedure

MODEL	2004 MY XJ range
VIN	G15000-G20728

Issue:

A small number of 2004 MY XJ range vehicles within the above VIN range, may have an incorrect luggage compartment lock installed, which will permit access with the 'valet' key. Should a customer express concern, a new lock should be installed.

Action:

> **Note:** When carrying out key and lock checks during PDI please ensure that valet key operation is checked to ensure customer satisfaction.

In case of a customer complaint of the above condition on a 2004 MY XJ range, install a new lock cylinder (see Workshop Manual, JTIS CD ROM, section: 501-14, SRO 76.19.19).

Parts Information:

> **Note:** Do not replace the entire vehicle lock set. When ordering a new luggage compartment lock, the original key number **MUST** be provided. If the original key number is not supplied, the order will be cancelled without notification.

DESCRIPTION	PART NUMBER	QTY
luggage compartment lock	C2C 2901	1

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Warranty Information:

Warranty claims should be submitted quoting the information found in the table below. This will result in payment of the stated time and, where applicable parts/miscellaneous expense codes as listed.

Description	SRO	Time	Causal Part Number
Install a new luggage compartment lock	76.19.19	0.4 hrs.	C2C 2901

JAGUAR	XJ range	DATE 02/04	XJ501-07

SERVICE **TECHNICAL BULLETIN**

Entry Of Water Into Vehicle – Possible Sources

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

This bulletin provides information to aid technicians in determining possible areas of water entry into the vehicle.

Action:

In case of a verified customer concern, locate the point of water ingress, and perform the appropriate repair.

POSSIBLE POINTS OF WATER ENTRY

Water ingress around the luggage compartment

Issue:

Water entering the spare wheel well causing the luggage compartment carpet to be wet towards the front of the luggage compartment.

Possible cause:

Hole in sealer between the rear fender and bottom corner of backlight panel, or forward channel seam leaking (Illustration 1).

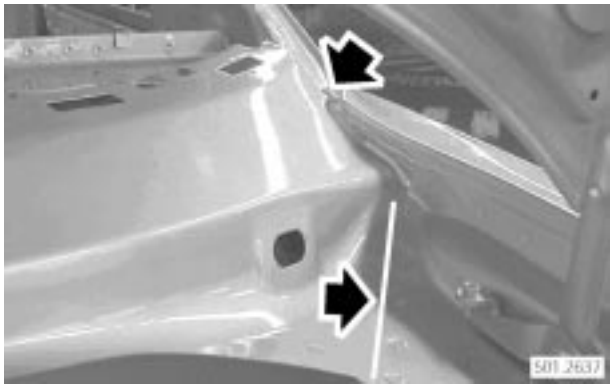

ILLUSTRATION 1

Issue:

Water entering the spare wheel well causing the luggage compartment carpet to be wet.

Possible cause:

Water tracking underneath the luggage compartment aperture seal (Illustration 2).

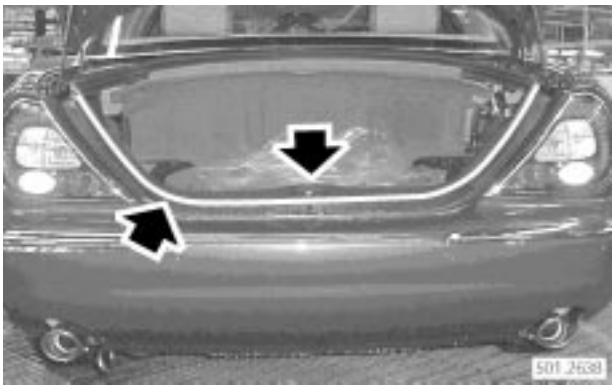

ILLUSTRATION 2

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Issue:

The luggage compartment carpet is wet at one or both sides.

Possible cause:

Water ingress through luggage compartment lid hinge securing bolts (Illustration 3).

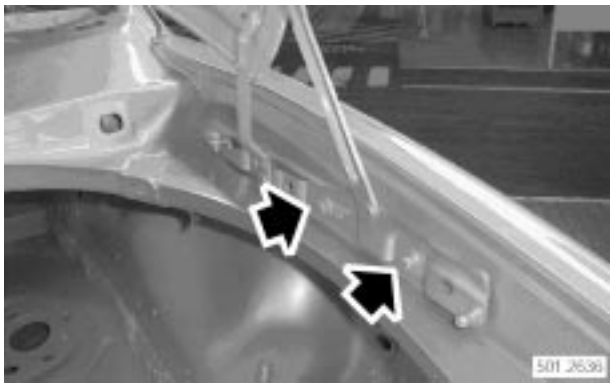

ILLUSTRATION 3

Issue:

The luggage compartment carpet is wet towards the rear of the luggage compartment.

Possible cause:

Rear fender seam leaking (Illustration 4).

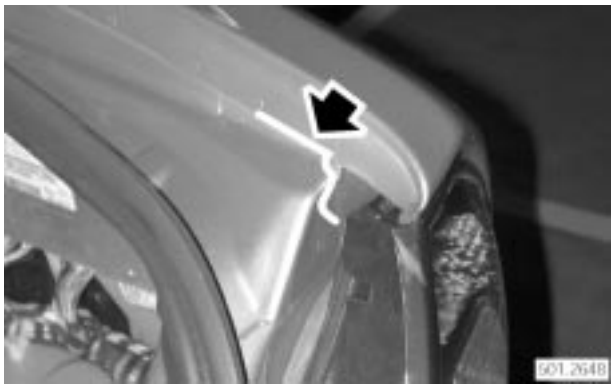

ILLUSTRATION 4

Issue:

Water ingress onto the spare wheel well.

Possible cause:

Luggage compartment floor seams leaking (Illustration 5).

Note: Water leak mainly from vertical part of the seam.

ILLUSTRATION 5

Issue:

Water ingress into the rear license plate lamps.

Possible cause:

Luggage compartment trim finisher is not correctly sealed to the luggage compartment lid (Illustration 6).

Note: Foam attached to finisher may be distorted.

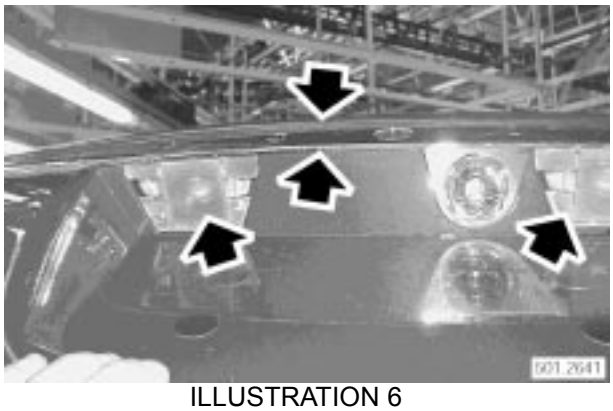

ILLUSTRATION 6

Water Ingress into front footwells

Issue:

Water ingress into the driver's footwell.

Possible cause:

Water can track between the body panels where the lower steering column exits the bulkhead.

Note: Apply a suitable wet sealant to the area shown (Illustration 7).

ILLUSTRATION 7

Issue:

Water ingress into the front footwells.

Possible cause:

Seams between inner front fender and bulkhead are leaking (Illustration 8).

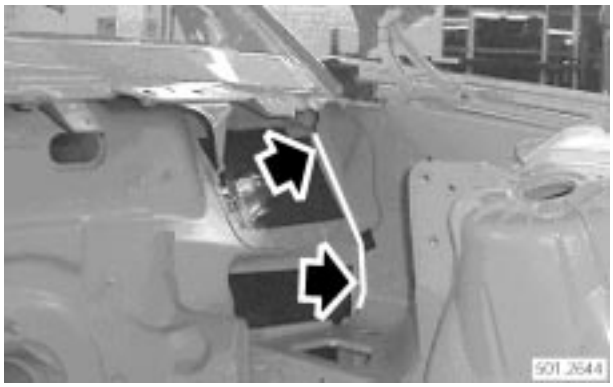

ILLUSTRATION 8

Issue:

Water ingress into the front passenger footwell.

Possible cause:

Patch over hole can leak water (Illustration 9).

Note: On the driver's side this hole is used to mount the plenum drain tube. On passenger side a blanking patch is installed.

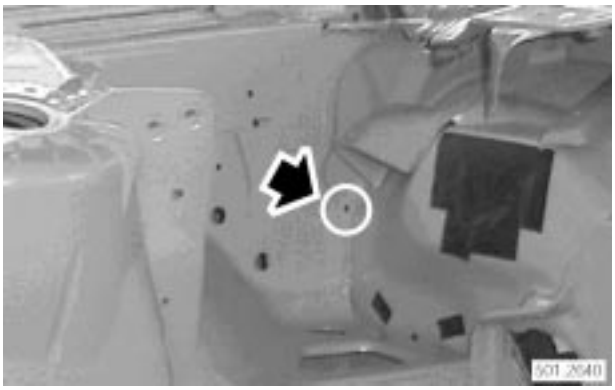

ILLUSTRATION 9

Issue:

Water ingress into the front footwell.

Possible cause:

Water ingress from harness grommet under front wheel arch (Illustration 10).

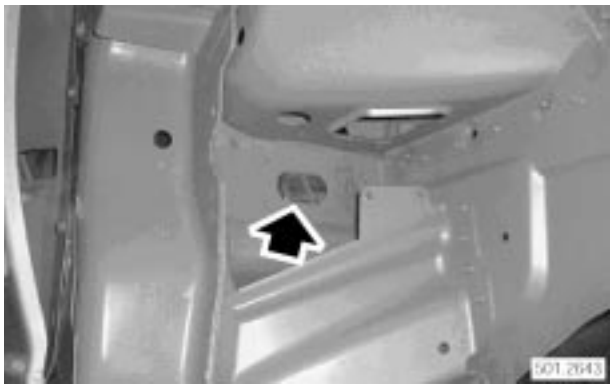

ILLUSTRATION 10

Water Ingress into the rear of the cabin

Issue:

Sill carpet wet at rear.

Possible cause:

Water tracks along joint of ‘C’ pillar/door shut joint under the rubber finisher, then tracks down along draft welt.

Note: Remove rubber finisher and apply a suitable wet sealant (to the area shown) to block the water path (Illustration 11).

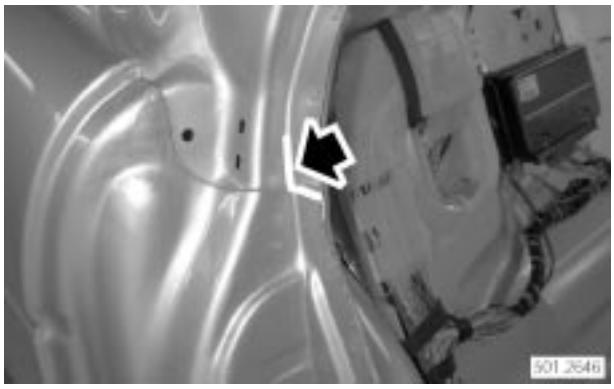

ILLUSTRATION 11

Issue:

Water ingress into the cabin or boot.

Possible cause:

Water can run from the drain channel, behind the putty, and then down onto the inner wheel arch. From here the water can run forwards into the cabin, or rearwards into the luggage compartment (Illustration 12).

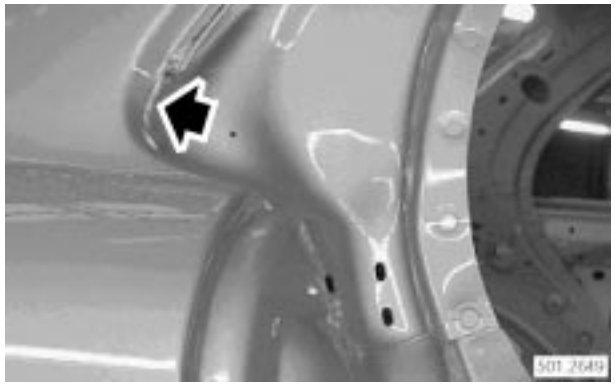

ILLUSTRATION 12

Issue:

Water ingress into the rear of the cabin.

Possible cause:

Water ingress through the seams by the rear seat (Illustration 13).

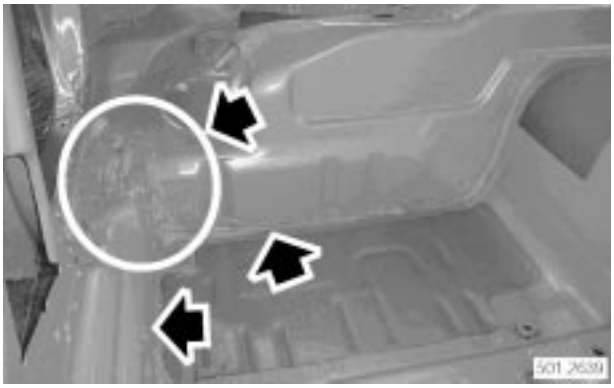

ILLUSTRATION 13

JAGUAR	XJ range	DATE 09/04	XJ501-09

SERVICE **TECHNICAL BULLETIN**

Supplemental Restraint System (SRS) – Flash Codes & PID Code Definitions – Diagnostics

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

This bulletin provides information on Flash Codes and PID code descriptions to assist in the diagnosis of the SRS.

This document is to be used as a guide only. It supports the existing diagnostic equipment, circuit diagrams in the Electrical Guide, and workshop manual.

Action:

FLASH CODES

Determine any Flash Code(s) that may be stored in the Restraint Control Module (RCM) by observing the SRS warning indicator displayed on the instrument cluster.

> **Note:** Only one Flash Code will be displayed at a time, however there may be multiple fault codes stored, which can appear after one fault is repaired.

DTC & PID CODES

Retrieve any logged Diagnostic Trouble Codes (DTCs) from the Restraint Control Module (RCM) using the Worldwide Diagnostic System (WDS).

> **Note:** The Parameter Identification (PID) code, which is displayed on the WDS screen in brackets nest to the DTC, differs from the Flash Code. These two codes must not be confused as incorrect diagnosis may occur.

DIAGNOSIS

> ⚠ **WARNING:** ENSURE ALL SAFETY PROCEDURES ARE FOLLOWED BEFORE AND DURING ANY WORK THAT IS CARRIED OUT ON THE SRS.

Using the Index, retrieved Flash Code, retrieved DTCs and PID codes determine the correct fault description. Check the list of possible causes against that fault description

NOTE: THE INFORMATION IN TECHNICAL BULLETINS IS INTENDED FOR USE BY TRAINED, PROFESSIONAL TECHNICIANS WITH THE KNOWLEDGE, TOOLS, AND EQUIPMENT TO DO THE JOB PROPERLY AND SAFELY. IT INFORMS THESE TECHNICIANS OF CONDITIONS THAT MAY OCCUR ON SOME VEHICLES, OR PROVIDES INFORMATION THAT COULD ASSIST IN PROPER VEHICLE SERVICE. THE PROCEDURES SHOULD NOT BE PERFORMED BY "DO-IT-YOURSELFERS." DO NOT ASSUME THAT A CONDITION DESCRIBED AFFECTS YOUR CAR. CONTACT A JAGUAR RETAILER TO DETERMINE WHETHER THE BULLETIN APPLIES TO YOUR VEHICLE.

for poor connections, backed out/bent pins, visible damage, or trapped harness.

Note: If a fault is identified with the Occupancy Classification System (OCS) module, passenger seat weight sensor or passenger seat weight sensor harness, all of these components must be replaced as a complete kit.

Note: If the RCM has been identified as being faulty and requires replacement, any additional faults within the SRS system MUST be repaired and DTCs cleared BEFORE replacing the RCM.

Index

Flash Code	Combination Faults Page 4	Front Air Bags Page 5	Side Air Bags Page 7	Side Air Curtains Page 8	Safety Belt Pretensioners Page 9	Impact Sensors Page 11	Occupant Classification System (OCS) Page 12	Occupant Position System (OPS) Page 13	Front Safety Belt Buckle and Seat Track Position Switches Page 14	Miscellaneous Page 15	Component Replacement Page 16
12											X
13											X
14										X	
15											X
16	X						X				X
17	X							X			X
18										X	
19	X	X									
21	X	X									
22	X		X								
23	X		X								
24	X			X							
25	X			X							
33	X				X						
34	X				X						
35	X				X						
36	X				X						
37	X				X						
42	X					X					X
43	X					X					X
44	X					X					X
45	X					X					X
46	X					X					X
49	X								X		
51	X								X		
52	X								X		
53										X	
ON	X									X	
OFF										X	

Combination Faults

Flash Code	DTC (PID code)	Fault Description	Possible Causes
16	B2290 (26)	Occupancy Classification System (OCS) Fault	Connector: SP028
	B2290 (27)		
52	B2692		
19	B2293 (29)	Driver Air Bag Front - Stage 1 Open Circuit	Connector: IP076, SW008
	B2293 (21)	Driver Air Bag Front - Stage 2 Open Circuit	
21	B2293 (25)	Passenger Air Bag Front - Stage 1 Open Circuit	Connector: IP077
	B2293 (17)	Passenger Air Bag Front - Stage 2 Open Circuit	
33	B2292 (31)	Driver Pretensioner Squib Front - Low Resistance	Connector: SD016
22	B2295 (29)	Driver Air Bag Side – Open Circuit	
34	B2292 (26)	Passenger Pretensioner Circuit Front - Open Circuit	Connector: SP016
23	B2295 (25)	Passenger Air Bag Side – Open Circuit	
46	B2296 (25)	Passenger Side Impact Sensor Rear - Mount/Communication Fault	Connector: CR087
49	C1981	Driver Seat Position Switch Circuit Fault	
51	B2691	Driver Safety Belt Buckle Switch Front - Circuit Fault	
52	B2692	Passenger Safety Belt Buckle Switch Front - Circuit Fault	
42	B2296 (19)	Front Impact Sensor - Mount/Communication Fault	
45	(27)	Driver Side Impact Sensor Rear - Mount/Communication Fault	
44	(29)	Passenger Side Impact Sensor Front - Mount/Communication Fault	
43	(31)	Driver Side Impact Sensor Front - Mount/Communication Fault	
23	B2295 (25)	Passenger Air Bag Side – Open Circuit	
22	(29)	Driver Air Bag Side – Open Circuit	
25	B2294 (25)	Passenger Side Air Curtain – Open Circuit	
24	(29)	Driver Side Air Curtain – Open Circuit	
36	B2292 (15)	Center Pretensioner Circuit Rear – Open Circuit	
37	(18)	Passenger Pretensioner Circuit Rear – Open Circuit	
35	(22)	Driver Pretensioner Circuit Rear – Open Circuit	
34	(26)	Passenger Pretensioner Circuit Front – Open Circuit	
33	(30)	Driver Pretensioner Circuit Front – Open Circuit	
ON		Restraint Control Module (PAD Lamp On Permanently, No Diagnostic Communications)	Connector: CR086
17	B2291 (28)	Occupant Position System (OPS) Calibration Fault	Clear DTCs and Cycle Ignition
	(29)	Occupant Position System (OPS) Communication Fault	
16	B2290	Occupancy Classification System (OCS) Fault	Local CAN open/short
17	B2291	Occupant Position System (OPS) Fault	

Front Air Bags

Flash Code	DTC (PID code)	Fault Description	Possible Causes
19	B2293 (20)	Driver Air Bag Front - Stage 2 Squib Low Resistance	Connector: SW008, SW012 Clockspring Connector: IP076, CR086 Driver Air Bag Front Harness: Instrument Panel, Cabin
19	B2293 (21)	Driver Air Bag Front - Stage 2 Open Circuit	Connector: SW008, SW012 Clockspring Connector: IP076, CR086 Driver Air Bag Front Harness: Instrument Panel, Cabin
19	B2293 (22)	Driver Air Bag Front - Stage 2 Short Circuit to Battery	Clockspring Connector: SW008, SW012, IP076, CR086 Harness: Instrument Panel, Cabin
19	B2293 (23)	Driver Air Bag Front - Stage 2 Short Circuit to Ground	Harness: Instrument Panel, Cabin Clockspring Connector: IP076, CR086 Driver Air Bag Front
19	B2293 (28)	Driver Air Bag Front - Stage 1 Squib Low Resistance	Connector: SW008, SW011 Clockspring Connector: IP076, CR086 Driver Air Bag Front Harness: Instrument Panel, Cabin
19	B2293 (29)	Driver Air Bag Front - Stage 1 Open Circuit	Connector: SW008, SW011 Clockspring Connector: IP076, CR086 Driver Air Bag Front Harness: Instrument Panel, Cabin
19	B2293 (30)	Driver Air Bag Front - Stage 1 Short to Battery	Clock Spring Connector: SW008, SW011, IP076, CR086 Harness: Instrument Panel, Cabin
19	B2293 (31)	Driver Air Bag Front - Stage 1 Short to Ground	Harness: Instrument Panel, Cabin Clockspring Connector: IP076, CR086 Driver Air Bag Front

Front Air Bags – Continued

Flash Code	DTC (PID code)	Fault Description	Possible Causes
21	B2293 (24)	Passenger Air Bag Front - Stage 1 Squib Low Resistance	Connector: IP056, IP077, CR086 Passenger Air Bag Front Harness: Instrument Panel, Cabin
21	B2293 (25)	Passenger Air Bag Front - Stage 1 Open Circuit	Connector: IP056, IP077, CR086 Passenger Air Bag Front Harness: Instrument Panel, Cabin
21	B2293 (26)	Passenger Air Bag Front - Stage 1 Short to Battery	Connector: IP056, IP077, CR086 Harness: Instrument Panel, Cabin
21	B2293 (27)	Passenger Air Bag Front – Stage 1 Short to Ground	Harness: Instrument Panel, Cabin Connector: IP056, IP077, CR086 Passenger Air Bag Front
21	B2293 (16)	Passenger Air Bag Front - Stage 2 Squib Low Resistance	Connector: IP015, IP077, CR086 Passenger Air Bag Front Harness: Instrument Panel, Cabin
21	B2293 (17)	Passenger Air Bag Front - Stage 2 Open Circuit	Connector: IP015, IP077, CR086 Passenger Air Bag Front Harness: Instrument Panel, Cabin
21	B2293 (18)	Passenger Air Bag Front - Stage 2 Short to Battery	Connector: IP015, IP077, CR086 Harness: Instrument Panel, Cabin
21	B2293 (19)	Passenger Air Bag Front - Stage 2 Short to Ground	Harness: Instrument Panel, Cabin Connector: IP015, IP077, CR086 Passenger Air Bag Front

Side Air Bags			
Flash Code	**DTC (PID code)**	**Fault Description**	**Possible Causes**
22	B2295 (28)	Driver Air Bag Squib Side – Low Resistance	Connector: SD016, SD017, CR087 Driver Air Bag Side Harness: Seat, Cabin
22	B2295 (29)	Driver Air Bag Side – Open Circuit	Connector: SD016, SD017, CR087 Driver Air Bag Side Harness: Seat, Cabin
22	B2295 (30)	Driver Air Bag Side - Short to Ground	Harness: Seat, Cabin Connector: SD016, SD017, CR087 Driver Air Bag Side
22	B2295 (31)	Driver Air Bag Side - Short to Battery	Connector: SD016, SD017, CR087 Harness: Seat, Cabin
23	B2295 (24)	Passenger Air Bag Squib Side – Low Resistance	Connector: SP016, SP017, CR087 Passenger Air Bag Side Harness: Seat, Cabin
23	B2295 (25)	Passenger Air Bag Side - Open Circuit	Connector: SP016, SP017, CR087 Passenger Air Bag Side Harness: Seat, Cabin
23	B2295 (26)	Passenger Air Bag Side - Short to Ground	Harness: Seat, Cabin Connector: SP016, SP017, CR087 Passenger Air Bag Side
23	B2295 (27)	Passenger Air Bag Side - Short to Battery	Connector: SP016, SP017, CR087 Harness: Seat, Cabin

Side Air Curtain

Flash Code	DTC (PID code)	Fault Description	Possible Causes
24	B2294 (28)	Driver Side Air Curtain Squib - Low Resistance	Connector: CR062, CR087 Driver Side Air Curtain Harness: Cabin
24	B2294 (29)	Driver Side Air Curtain - Open Circuit	Connector: CR062, CR087 Driver Side Air Curtain Harness: Cabin
24	B2294 (30)	Driver Side Air Curtain - Short to Ground	Harness: Cabin Connector: CR062, CR087 Driver Side Air Curtain
24	B2294 (31)	Driver Side Air Curtain - Short to Battery	Connector: CR062, CR087 Harness: Cabin
25	B2294 (24)	Passenger Side Air Curtain Squib - Low Resistance	Connector: CR033, CR087 Passenger Side Air Curtain Harness: Cabin
25	B2294 (25)	Passenger Side Air Curtain – Open Circuit	Connector: CR033, CR087 Passenger Side Air Curtain Harness: Cabin
25	B2294 (26)	Passenger Side Air Curtain - Short to Ground	Harness: Cabin Connector: CR033, CR087 Passenger Side Air Curtain
25	B2294 (27)	Passenger Side Air Curtain - Short to Battery	Connector: CR033, CR087 Harness: Cabin

Safety Belt Pretensioners

Flash Code	DTC (PID code)	Fault Description	Possible Causes
33	B2292 (28)	Driver Pretensioner Front - Short to Ground	Harness: Seat, Cabin Connector: SD019, SD016, CR087 Driver Pretensioner Front
33	B2292 (29)	Driver Pretensioner Front - Short to Battery	Connector: SD019, SD016, CR087 Harness: Seat, Cabin
33	B2292 (30)	Driver Pretensioner Front - Open Circuit	Connector: SD019, SD016, CR087 Driver Pretensioner Front Harness: Seat, Cabin
33	B2292 (31)	Driver Pretensioner Squib Front - Low Resistance	Connector: SD019, SD016, CR087 Driver Pretensioner Front Harness: Seat, Cabin
34	B2292 (24)	Passenger Pretensioner Front - Short to Ground	Harness: Seat, Cabin Connector, SP019, SP016, CR087 Passenger Pretensioner Front
34	B2292 (25)	Passenger Pretensioner Front - Short to Battery	Connector: SP019, SP016, CR087 Harness: Seat, Cabin
34	B2292 (26)	Passenger Pretensioner Front - Open Circuit	Connector: SP019, SP016, CR087 Passenger Pretensioner Front Harness: Seat, Cabin
34	B2292 (27)	Passenger Pretensioner Squib Front - Low Resistance	Connector: SP019, SP016, CR087 Passenger Pretensioner Front Harness: Seat, Cabin
35	B2292 (20)	Driver Pretensioner Rear - Short to Ground	Harness: Cabin Connector: CR064, CR087 Driver Pretensioner Rear
35	B2292 (21)	Driver Pretensioner Rear - Short to Battery	Connector: CR064, CR087 Harness: Cabin
35	B2292 (22)	Driver Pretensioner Rear - Open Circuit	Connector: CR064, CR087 Driver Pretensioner Rear Harness: Cabin
35	B2292 (23)	Driver Pretensioner Squib Rear - Low Resistance	Connector: CR064, CR087 Driver Pretensioner Rear Harness: Cabin
36	B2292 (12)	Center Pretensioner Squib Rear - Low Resistance	Connector: CR065, CR087 Center Pretensioner Rear Harness: Cabin
36	B2292 (13)	Center Pretensioner Rear - Short to Ground	Harness: Cabin Connector: CR065, CR087 Center Pretensioner Rear

Safety Belt Pretensioners – Continued.

Flash Code	DTC (PID code)	Fault Description	Possible Causes
36	B2292 (14)	Center Pretensioner Rear - Short to Battery	Connector: CR065, CR087 Harness: Cabin
36	B2292 (15)	Center Pretensioner Rear - Open Circuit	Connector: CR065, CR087 Center Pretensioner Rear Harness: Cabin
37	B2292 (16)	Passenger Pretensioner Rear - Short to Ground	Harness: Cabin Connector: CR066, CR087 Passenger Pretensioner Rear
37	B2292 (17)	Passenger Pretensioner Rear - Short to Battery	Connector: CR066, CR087 Harness: Cabin
37	B2292 (18)	Passenger Pretensioner Rear - Open Circuit	Connector: CR066, CR087 Passenger Pretensioner Rear Harness: Cabin
37	B2292 (19)	Passenger Pretensioner Squib Rear - Low Resistance	Connector: CR066, CR087 Passenger Pretensioner Rear Harness Cabin

Impact Sensors

Flash Code	DTC (PID code)	Fault Description	Possible Causes
42	B2296 (19)	Front Impact Sensor Mount/Communication Fault	Connector: EC050, EC046, CR087 Harness: Engine, Cabin Impact sensor mount fixing loose Front Impact Sensor
43	B2296 (31)	Driver Side Impact Sensor Front - Mount/Communication Fault	Connector: CR060, CR087 Harness: Cabin Impact sensor mount fixing loose Driver Side Impact Sensor Front
44	B2296 (29)	Passenger Side Impact Sensor Front - Mount/Communication Fault	Connector: CR035, CR087 Harness: Cabin Impact sensor mount fixing loose Passenger Side Impact Sensor Front
45	B2296 (27)	Driver Side Impact Sensor Rear - Mount/Communication Fault	Connector: CR061, CR087 Harness: Cabin Impact sensor mount fixing loose Driver Side Impact Sensor Rear
46	B2296 (25)	Passenger Side Impact Sensor Rear - Mount/Communication Fault	Connector: CR051, CR087 Harness: Cabin Impact sensor mount fixing loose Passenger Side Impact Sensor Rear

Occupant Classification System (OCS)

Flash Code	DTC (PID code)	Fault Description	Possible Causes
16	B2290 (24)	Passenger OCS Sensing Element Fault Front	Passenger seat weight pressure sensor Harness: Passenger seat weight pressure sensor Connector: SP003, SP002
16	B2290 (26)	OCS Communication Fault	Connector: SP002, SP030, SP028, CR087 Harness: Seat, Cabin
16	B2290 (27)	OCS Module Fault	Connector: SP002, SP030, SP028, CR087 Harness: Seat, Cabin
16	B2909 (29)	Passenger Safety Belt Tension Sensor Front – Short to Ground	Connector: SP033, SP002 Harness: Seat Passenger Safety Belt Tension Sensor Front
16	B2909 (31)	Passenger Safety Belt Tension Sensor Front – Circuit Fault	Passenger Safety Belt Tension Sensor Front Connector: SP033, SP002 Harness: Seat

Occupant Position System (OPS)			
Flash Code	**DTC (PID code)**	**Fault Description**	**Possible Causes**
17	B2291 (24)	Passenger OPS Sensor 4 Center (outer headliner/B pillar) – Sensor Fault	Connector: RF018, RF002, SP028, SP030 Passenger OPS Sensor 4 Center Harness: Roof, Seat
17	B2291 (25)	Passenger OPS Sensor 3 Front (A pillar) – Sensor Fault	Connector: CR105, SP028, SP030, Passenger OPS Sensor 3 Front Harness: Cabin, Seat
17	B2291 (26)	Passenger OPS Sensor 2 Front (instrument panel console) – Sensor Fault	Connector: CL006/007, CL003, CC002, TL093, SP028, SP030 Passenger OPS Sensor 2 Front Harness: Instrument Panel Console Link, Instrument Console, Telematics, Seat
17	B2291 (27)	Passenger OPS Sensor 1 Center (center headliner) – Sensor Fault	Connector: RF016, RF002, SP028, SP030 Passenger OPS Sensor 1 Center Harness: Roof, Seat
17	B2291 (28)	Passenger OPS Calibration Fault	Clear Fault Code and Cycle Ignition
17	B2291 (29)	Passenger OPS Communications Fault	Clear Fault Code and Cycle Ignition

Front Safety Belt Buckle and Seat Track Position Switches

Flash Code	DTC (PID code)	Fault Description	Possible Causes
49	C1981	Driver Seat Track Position Switch Front - Circuit Fault	Connector: SD020, SD028, CR087 Driver Seat Track Position Switch Harness: Seat, Cabin
49	C1947	Seat Track Position Switch Circuit Short to Ground - Driver Front	Harness Seat Harness Cabin SD020 SD028 CR087 Seat Track Position Switch Driver
49	C1948	Driver Seat Track Position Switch Front - Circuit Resistance out of Range	Driver Seat Track Position Switch Connector: SD020, SD028, CR087
51	B2691	Driver Safety Belt Buckle Switch Front - Circuit Fault	Connector: SD019, SD028, CR087 Driver Safety Belt Buckle Switch Harness: Seat, Cabin
51	B2434	Driver Safety Belt Buckle Switch Front - Short to Ground	Harness: Seat, Cabin Connector: SD019, SD028, CR087 Driver Safety Belt Buckle Switch
51	B2435	Driver Safety Belt Buckle Switch Front - Circuit Resistance out of Range	Driver Safety Belt Buckle Switch Connector: SD019, SD028, CR087
52	B2438	Passenger Safety Belt Buckle Switch Front - Short to Ground	Harness: Seat, Cabin Connector: SP019, SP028, CR087 Passenger Safety Belt Buckle Switch
52	B2692	Passenger Safety Belt Buckle Switch Front - Circuit Fault	Connector: SP019, SP028, CR087 Passenger Safety Belt Buckle Switch Harness: Seat, Cabin
52	B2439	Passenger Safety Belt Buckle Switch Front – Circuit Resistance out of Range	Passenger Safety Belt Buckle Switch Connector: SP019, SP028, CR087

Miscellaneous

Flash Code	DTC (PID code)	Fault Description	Possible Causes
14	B1921	Restraint Control Module – Open Circuit or High Resistance on Bracket Ground	Restraint Control Module Fixings Loose Restraint Control Module
18	B1884	Passenger Air Bag Deactivation (PAD) Warning Indicator – Open Circuit (PAD warning indicator OFF)	Connector: IP068, IP058, IP003, CR086 PAD Lamp Harness: Cabin, Instrument Panel
18	B1884	PAD Warning Indicator – Short to Ground (PAD warning indicator ON)	Harness: Cabin, Instrument Panel Connector: IP068, IP003, CR086
18	B1890	PAD Warning Indicator - Short To Battery (PAD warning indicator OFF)	Connector: IP068, IP003, CR086 Harness: Cabin, Instrument Panel
53	B1891	Air Bag Audible Warning - Short to Battery	Harness: Cabin, Instrument Panel Connector: IP005, IP017, CR086
53	B1892	Air Bag Audible Warning – Short to Ground or Open Circuit	Connector: IP005, IP017, CR086 Harness: Cabin, Instrument Panel
ON	B1317	Battery Voltage High	Charging system
ON	B1318	Battery Voltage Low	Charging system
ON	B1870	Air Bag Warning Indicator - Short To Battery	Connector: IP005, IP017, CR086 Harness: Instrument Panel, Cabin
ON	B1869	Air Bag Warning Indicator - Open Circuit	Connector: IP005, IP017, CR086 Harness: Instrument Panel, Cabin
OFF	B1869	Air Bag Warning Indicator – Short to Ground	Harness: Instrument Panel, Cabin Connector: IP005, IP017, CR086
ON		Feed to Restraint Control Module Open Circuit/Short to Ground (unable to communicate with module)	Fuse 29 (10 A) blown or missing - Passenger Junction Fuse Box
12	B1342	Restraint Control Module – Internal Failure	Restraint Control Module – Fixing Loose Battery Voltage out of Range Ground Points: G07AL, G07AR, G07BS, G07AS Restraint Control Module

Component Replacement

Flash Code	DTC (PID code)	Fault Description	Part to be replaced
13	B1231	Crash Data Memory Full	If DTC can be cleared no further action is required. If DTC can't be cleared replace the RCM
15	C1414	RCM Version Conflicts with OCS	Restraint Control Module or OCS Service Kit
16	B2290 (25)	OCS Calibration Fault	OCS Service Kit
16	B2290 (27)	Generic OCS Module Fault	OCS Service Kit
17	B2291 (30)	Generic OCS Module Fault	OCS Service Kit
42	B2296 (18)	Front Impact Sensor - Internal Fault	Front Impact Sensor
43	B2296 (30)	Driver Side Impact Sensor Front - Internal Fault	Driver Side Impact Sensor Front
44	B2296 (28)	Passenger Side Impact Sensor Front - Internal Fault	Passenger Side Impact Sensor Front
45	B2296 (26)	Driver Side Impact Sensor Rear - Internal Fault	Driver Side Impact Sensor Rear
46	B2296 (24)	Passenger Side Impact Sensor Rear - Internal Fault	Passenger Side Impact Sensor Rear

Parts Information

Not applicable

Warranty Information

Not applicable

JAGUAR	XJ range	DATE 12/04	XJ501-11

SERVICE **TECHNICAL BULLETIN**

Front Seat Backrest Rear Cover – Removal and Installation – Correct Procedure On GTR

MODEL 2004 MY-ON XJ range

VIN G00001-ON

Issue:

On 2004 MY-on XJ range vehicles, care must be used when removing the front seat back rest cover to prevent breakage. This Technical Bulletin references the correct removal procedure for the front seat backrest rear cover on GTR.

Action:

To remove the front seat backrest rear cover, follow the Service Instruction outlined below.

1. Remove and install the front seat backrest rear cover (see Global Technical Reference GTR Workshop Manual, section 501-10).

Global Technical Reference (GTR) Workshop Manual Information:

Dealer access: https://hub.franchise.jaguar.com

Internet access: http://www.jaguartechinfo.com

Parts Information:

DESCRIPTION	PART NUMBER	QTY
N/A	N/A	

Warranty Information:

Description	SRO	Time	Causal Part Number
N/A	-	-	N/A

NOTE: THE INFORMATION IN TECHNICAL BULLETINS IS INTENDED FOR USE BY TRAINED, PROFESSIONAL TECHNICIANS WITH THE KNOWLEDGE, TOOLS, AND EQUIPMENT TO DO THE JOB PROPERLY AND SAFELY. IT INFORMS THESE TECHNICIANS OF CONDITIONS THAT MAY OCCUR ON SOME VEHICLES, OR PROVIDES INFORMATION THAT COULD ASSIST IN PROPER VEHICLE SERVICE. THE PROCEDURES SHOULD NOT BE PERFORMED BY "DO-IT-YOURSELFERS." DO NOT ASSUME THAT A CONDITION DESCRIBED AFFECTS YOUR CAR. CONTACT A JAGUAR DEALER TO DETERMINE WHETHER THE BULLETIN APPLIES TO YOUR VEHICLE.

JAGUAR	XJ range	DATE 04/04	XJ501-R719

SERVICE **TECHNICAL BULLETIN**

Passenger Air Bag Door – Trim Rough Edges Of Opening – Recall R719

MODEL	2004 MY XJ range
VIN	Refer to VIN list

Issue:

A concern has been identified on a small number of 2004 MY XJ vehicles within the above VIN range. A poor cutting process during the manufacture of the air bag instrument panel opening may have resulted in a rough finish of the passenger air bag instrument panel opening edge. If the passenger air bag were to deploy there is a possibility that the air bag could be torn.

Only those vehicles listed in this bulletin by VIN need to be inspected and, if necessary, reworked.

Jaguar will be contacting customers with a letter which is included in this bulletin for reference.

Action:

Refer to the VIN list included in this bulletin to determine which vehicles are affected by this Recall.

Inspect the passenger air bag opening and, if necessary, remove any sharp serrated edges.

All unsold vehicles or vehicles that have not been handed over to the customer must be inspected and, if necessary, repaired prior to sale or onward distribution.

RECALL

NOTE: THE INFORMATION IN TECHNICAL BULLETINS IS INTENDED FOR USE BY TRAINED, PROFESSIONAL TECHNICIANS WITH THE KNOWLEDGE, TOOLS, AND EQUIPMENT TO DO THE JOB PROPERLY AND SAFELY. IT INFORMS THESE TECHNICIANS OF CONDITIONS THAT MAY OCCUR ON SOME VEHICLES, OR PROVIDES INFORMATION THAT COULD ASSIST IN PROPER VEHICLE SERVICE. THE PROCEDURES SHOULD NOT BE PERFORMED BY "DO-IT-YOURSELFERS." DO NOT ASSUME THAT A CONDITION DESCRIBED AFFECTS YOUR CAR. CONTACT A JAGUAR RETAILER TO DETERMINE WHETHER THE BULLETIN APPLIES TO YOUR VEHICLE.

WORKSHOP PROCEDURE

1. Open door, open luggage compartment.
2. Disconnect the battery, see Workshop Manual, section: 414-01.

> ⚠ **Warning:** Wait one minute after disconnecting battery to allow the air bag system to deactivate.

3. Use a nonmetallic tool to displace and reposition the passenger air bag deployment door to avoid damage.
4. Place a suitable clean cloth over the passenger air bag and deployment door (Illustration 1).

POTENTIAL LOCATION OF SERRATED EDGES ON UPPER EDGE (RHD VEHICLE SHOWN)

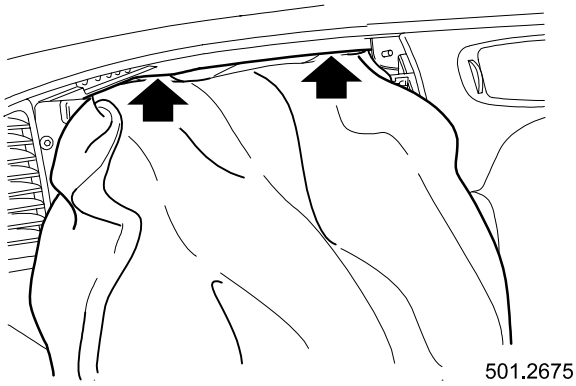

ILLUSTRATION 1

5. Inspect the passenger instrument panel air bag aperture for sharp serrated edges. If sharp serrated edges are evident, proceed to step 7 of this workshop procedure. If no sharp serrated edges are evident proceed to step 13 of this workshop procedure.

> ⚠ **Caution:** Use care not to cause damage to the instrument panel while filing smooth the serrated sharp edges of the air bag aperture.

6. Using a suitable file, remove any sharp serrated edges from the top edge of the aperture (Illustration 1).
7. Remove the cloth and reposition the air bag deployment door upwards and hold in position.
8. Place a suitable clean cloth behind the lower edge of the passenger air bag aperture.

> ⚠ **Caution:** Use care not to cause damage to the instrument panel while filing smooth the serrated sharp edges of the air bag aperture.

9. Using a suitable file, remove any sharp serrated edges from the aperture lower edge (Illustration 2).

POTENTIAL LOCATION OF SERRATED EDGES ON LOWER EDGE (RHD VEHICLE SHOWN)

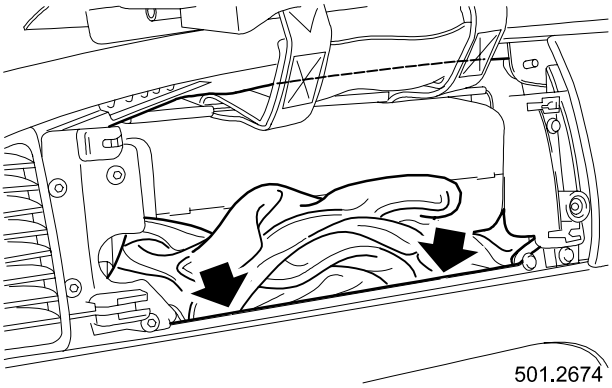

ILLUSTRATION 2

10. Remove the cloth from the vehicle.
11. Using a suitable vacuum cleaner, remove any remaining debris from the vehicle.
12. Align and fully seat the passenger air bag deployment door.
13. Reconnect the battery, see Workshop Manual, section: 414-01. Reset customer preferences.
14. Remove fender protection kit.
15. Close luggage compartment and door.

Global Technical Reference (GTR):

Dealer Access: https://hub.franchise.jaguar.com

Internet access: http://www.jaguartechinfo.com

Warranty Information:

Warranty claims should be submitted quoting program code R719 together with the relevant option code from the table below.

This will result in payment of the stated time and, where applicable the relevant parts/ miscellaneous expense codes.

The options that allow for drive in/drive out can only be claimed when the vehicle has been brought into the workshop for this action alone to be undertaken.

The SROs and parts listed above have been included for information only. There will be no requirement to enter the parts or SROs onto the claim.

Service Action R719

Model	VIN Range
2004 MY XJ Range	**4S**G25690 - **4S**G27957
2004 MY XJR	**4T**G25690 - **4T**G27957

Refer to specific VIN list starting on following page.

Program Code	Option	Description	SRO	Time	Part Number	Part Description	Qty
R719	B	Inspect aperture edge finish and if necessary rework	76.94.46	0.2 hrs.	-	-	-
R719	C	Inspect aperture edge finish and if necessary rework	76.94.46	0.2 hrs.	-	-	-
		Drive in/drive out	10.10.10	0.1 hrs.			

NOTE: Always perform a DDW claim search first to determine whether this service action has been performed on this vehicle. The “Review Claim History” function will provide a listing of all claims against the vehicle. If this service action number appears in the program code field, do not perform this service action.

USA VIN LIST

Chassis No.	Full VIN
G25764	SAJWA71C04SG25764
G25778	SAJWA71C04SG25778
G25781	SAJWA71C04SG25781
G25912	SAJWA71C04SG25912
G25926	SAJWA71C04SG25926
G25957	SAJWA71C04SG25957
G25974	SAJWA71C04SG25974
G25991	SAJWA71C04SG25991
G26025	SAJWA71C04SG26025
G26042	SAJWA71C04SG26042
G26073	SAJWA71C04SG26073
G26106	SAJWA71C04SG26106
G26123	SAJWA71C04SG26123
G26140	SAJWA71C04SG26140
G26218	SAJWA71C04SG26218
G26221	SAJWA71C04SG26221
G26252	SAJWA71C04SG26252
G26297	SAJWA71C04SG26297
G26333	SAJWA71C04SG26333
G26347	SAJWA71C04SG26347
G26395	SAJWA71C04SG26395
G26428	SAJWA71C04SG26428
G26512	SAJWA71C04SG26512
G26526	SAJWA71C04SG26526
G26607	SAJWA71C04SG26607
G26641	SAJWA71C04SG26641
G26655	SAJWA71C04SG26655
G26736	SAJWA71C04SG26736
G26767	SAJWA71C04SG26767
G26851	SAJWA71C04SG26851
G26865	SAJWA71C04SG26865
G26915	SAJWA71C04SG26915
G27255	SAJWA71C04SG27255
G27269	SAJWA71C04SG27269
G27367	SAJWA71C04SG27367
G27479	SAJWA71C04SG27479
G27675	SAJWA71C04SG27675
G27739	SAJWA71C04SG27739
G27921	SAJWA71C04SG27921
G27952	SAJWA71C04SG27952
G25790	SAJWA71C14SG25790
G25868	SAJWA71C14SG25868
G25871	SAJWA71C14SG25871
G25918	SAJWA71C14SG25918
G25935	SAJWA71C14SG25935
G25983	SAJWA71C14SG25983
G25997	SAJWA71C14SG25997
G26017	SAJWA71C14SG26017
G26034	SAJWA71C14SG26034
G26079	SAJWA71C14SG26079
G26082	SAJWA71C14SG26082
G26101	SAJWA71C14SG26101
G26115	SAJWA71C14SG26115
G26129	SAJWA71C14SG26129

Chassis No.	Full VIN
G26146	SAJWA71C14SG26146
G26163	SAJWA71C14SG26163
G26177	SAJWA71C14SG26177
G26339	SAJWA71C14SG26339
G26342	SAJWA71C14SG26342
G26633	SAJWA71C14SG26633
G26681	SAJWA71C14SG26681
G26762	SAJWA71C14SG26762
G26857	SAJWA71C14SG26857
G26941	SAJWA71C14SG26941
G27085	SAJWA71C14SG27085
G27099	SAJWA71C14SG27099
G27247	SAJWA71C14SG27247
G27295	SAJWA71C14SG27295
G27359	SAJWA71C14SG27359
G27443	SAJWA71C14SG27443
G27491	SAJWA71C14SG27491
G27541	SAJWA71C14SG27541
G27619	SAJWA71C14SG27619
G27667	SAJWA71C14SG27667
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G27796	SAJWA71C14SG27796
G27846	SAJWA71C14SG27846
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G25779	SAJWA71C24SG25779
G25863	SAJWA71C24SG25863
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G26141	SAJWA71C24SG26141
G26155	SAJWA71C24SG26155
G26317	SAJWA71C24SG26317
G26379	SAJWA71C24SG26379
G26382	SAJWA71C24SG26382
G26401	SAJWA71C24SG26401
G26589	SAJWA71C24SG26589
G26639	SAJWA71C24SG26639
G26771	SAJWA71C24SG26771
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G26883	SAJWA71C24SG26883
G27077	SAJWA71C24SG27077
G27239	SAJWA71C24SG27239
G27385	SAJWA71C24SG27385
G27435	SAJWA71C24SG27435
G27483	SAJWA71C24SG27483
G27497	SAJWA71C24SG27497
G27807	SAJWA71C24SG27807
G27855	SAJWA71C24SG27855
G27886	SAJWA71C24SG27886
G27936	SAJWA71C24SG27936
G25807	SAJWA71C34SG25807
G25838	SAJWA71C34SG25838

Chassis No.	Full VIN	Chassis No.	Full VIN
G25841	SAJWA71C34SG25841	G26464	SAJWA71C44SG26464
G25869	SAJWA71C34SG25869	G26500	SAJWA71C44SG26500
G25872	SAJWA71C34SG25872	G26724	SAJWA71C44SG26724
G25905	SAJWA71C34SG25905	G26819	SAJWA71C44SG26819
G25919	SAJWA71C34SG25919	G26884	SAJWA71C44SG26884
G25922	SAJWA71C34SG25922	G26917	SAJWA71C44SG26917
G25936	SAJWA71C34SG25936	G27159	SAJWA71C44SG27159
G25953	SAJWA71C34SG25953	G27243	SAJWA71C44SG27243
G26004	SAJWA71C34SG26004	G27307	SAJWA71C44SG27307
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G26133	SAJWA71C34SG26133	G27680	SAJWA71C44SG27680
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G26164	SAJWA71C34SG26164	G27890	SAJWA71C44SG27890
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G26388	SAJWA71C34SG26388	G26022	SAJWA71C54SG26022
G26407	SAJWA71C34SG26407	G26036	SAJWA71C54SG26036
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G26522	SAJWA71C34SG26522	G26098	SAJWA71C54SG26098
G26665	SAJWA71C34SG26665	G26215	SAJWA71C54SG26215
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G26089	SAJWA71C44SG26089	G25834	SAJWA71C64SG25834
G26092	SAJWA71C44SG26092	G25901	SAJWA71C64SG25901
G26173	SAJWA71C44SG26173	G25915	SAJWA71C64SG25915
G26206	SAJWA71C44SG26206	G25932	SAJWA71C64SG25932
G26223	SAJWA71C44SG26223	G25963	SAJWA71C64SG25963
G26237	SAJWA71C44SG26237	G25977	SAJWA71C64SG25977
G26254	SAJWA71C44SG26254	G25980	SAJWA71C64SG25980
G26285	SAJWA71C44SG26285	G26000	SAJWA71C64SG26000
G26450	SAJWA71C44SG26450	G26014	SAJWA71C64SG26014

Chassis No.	Full VIN
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G26045	SAJWA71C64SG26045
G26076	SAJWA71C64SG26076
G26109	SAJWA71C64SG26109
G26112	SAJWA71C64SG26112
G26126	SAJWA71C64SG26126
G26191	SAJWA71C64SG26191
G26238	SAJWA71C64SG26238
G26241	SAJWA71C64SG26241
G26272	SAJWA71C64SG26272
G26336	SAJWA71C64SG26336
G26367	SAJWA71C64SG26367
G26398	SAJWA71C64SG26398
G26434	SAJWA71C64SG26434
G26627	SAJWA71C64SG26627
G26689	SAJWA71C64SG26689
G26756	SAJWA71C64SG26756
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G26885	SAJWA71C64SG26885
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G25857	SAJWA71C74SG25857
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G26877	SAJWA71C74SG26877
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G26869	SAJWA71C84SG26869
G27049	SAJWA71C84SG27049
G27083	SAJWA71C84SG27083
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G27309	SAJWA71C84SG27309
G27407	SAJWA71C84SG27407
G27505	SAJWA71C84SG27505
G27553	SAJWA71C84SG27553
G27603	SAJWA71C84SG27603
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G25844	SAJWA71C94SG25844
G25861	SAJWA71C94SG25861
G25875	SAJWA71C94SG25875
G25908	SAJWA71C94SG25908
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G26072	SAJWA71C94SG26072
G26105	SAJWA71C94SG26105
G26119	SAJWA71C94SG26119
G26122	SAJWA71C94SG26122
G26136	SAJWA71C94SG26136
G26153	SAJWA71C94SG26153
G26203	SAJWA71C94SG26203
G26217	SAJWA71C94SG26217
G26279	SAJWA71C94SG26279
G26394	SAJWA71C94SG26394

Chassis No.	Full VIN	Chassis No.	Full VIN
G26413	SAJWA71C94SG26413	G26372	SAJWA73B14TG26372
G26430	SAJWA71C94SG26430	G26646	SAJWA73B14TG26646
G26685	SAJWA71C94SG26685	G26842	SAJWA73B14TG26842
G26752	SAJWA71C94SG26752	G27182	SAJWA73B14TG27182
G26783	SAJWA71C94SG26783	G27246	SAJWA73B14TG27246
G27013	SAJWA71C94SG27013	G27442	SAJWA73B14TG27442
G27285	SAJWA71C94SG27285	G27618	SAJWA73B14TG27618
G27299	SAJWA71C94SG27299	G27666	SAJWA73B14TG27666
G27352	SAJWA71C94SG27352	G27943	SAJWA73B14TG27943
G27383	SAJWA71C94SG27383	G25845	SAJWA73B24TG25845
G27495	SAJWA71C94SG27495	G26185	SAJWA73B24TG26185
G27531	SAJWA71C94SG27531	G27188	SAJWA73B24TG27188
G27769	SAJWA71C94SG27769	G27322	SAJWA73B24TG27322
G27903	SAJWA71C94SG27903	G27353	SAJWA73B24TG27353
G27920	SAJWA71C94SG27920	G27420	SAJWA73B24TG27420
G25786	SAJWA71CX4SG25786	G27532	SAJWA73B24TG27532
G25867	SAJWA71CX4SG25867	G27580	SAJWA73B24TG27580
G25917	SAJWA71CX4SG25917	G26213	SAJWA73B34TG26213
G25920	SAJWA71CX4SG25920	G26230	SAJWA73B34TG26230
G25979	SAJWA71CX4SG25979	G26406	SAJWA73B34TG26406
G25982	SAJWA71CX4SG25982	G26986	SAJWA73B34TG26986
G26016	SAJWA71CX4SG26016	G27278	SAJWA73B34TG27278
G26033	SAJWA71CX4SG26033	G27300	SAJWA73B34TG27300
G26064	SAJWA71CX4SG26064	G27426	SAJWA73B34TG27426
G26095	SAJWA71CX4SG26095	G27474	SAJWA73B34TG27474
G26114	SAJWA71CX4SG26114	G27538	SAJWA73B34TG27538
G26212	SAJWA71CX4SG26212	G25913	SAJWA73B44TG25913
G26226	SAJWA71CX4SG26226	G25958	SAJWA73B44TG25958
G26260	SAJWA71CX4SG26260	G25975	SAJWA73B44TG25975
G26291	SAJWA71CX4SG26291	G25992	SAJWA73B44TG25992
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G26677	SAJWA71CX4SG26677	G26043	SAJWA73B44TG26043
G26730	SAJWA71CX4SG26730	G26270	SAJWA73B44TG26270
G26775	SAJWA71CX4SG26775	G26298	SAJWA73B44TG26298
G26825	SAJWA71CX4SG26825	G26656	SAJWA73B44TG26656
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G27439	SAJWA71CX4SG27439	G27368	SAJWA73B44TG27368
G27487	SAJWA71CX4SG27487	G27404	SAJWA73B44TG27404
G27523	SAJWA71CX4SG27523	G27452	SAJWA73B44TG27452
G27781	SAJWA71CX4SG27781	G27516	SAJWA73B44TG27516
G25794	SAJWA73B04TG25794	G27628	SAJWA73B44TG27628
G26315	SAJWA73B04TG26315	G25743	SAJWA73B54TG25743
G26332	SAJWA73B04TG26332	G25998	SAJWA73B54TG25998
G27092	SAJWA73B04TG27092	G26049	SAJWA73B54TG26049
G27528	SAJWA73B04TG27528	G26455	SAJWA73B54TG26455
G27724	SAJWA73B04TG27724	G27086	SAJWA73B54TG27086
G27867	SAJWA73B04TG27867	G27198	SAJWA73B54TG27198
G25805	SAJWA73B14TG25805	G27220	SAJWA73B54TG27220
G26145	SAJWA73B14TG26145	G27332	SAJWA73B54TG27332
G26338	SAJWA73B14TG26338	G27752	SAJWA73B54TG27752

Chassis No.	Full VIN
G27816	SAJWA73B54TG27816
G27895	SAJWA73B54TG27895
G26304	SAJWA73B64TG26304
G26321	SAJWA73B64TG26321
G26366	SAJWA73B64TG26366
G26383	SAJWA73B64TG26383
G26433	SAJWA73B64TG26433
G26481	SAJWA73B64TG26481
G26576	SAJWA73B64TG26576
G26741	SAJWA73B64TG26741
G26772	SAJWA73B64TG26772
G26836	SAJWA73B64TG26836
G27050	SAJWA73B64TG27050
G27114	SAJWA73B64TG27114
G27226	SAJWA73B64TG27226
G27372	SAJWA73B64TG27372
G27484	SAJWA73B64TG27484
G27548	SAJWA73B64TG27548
G27923	SAJWA73B64TG27923
G25856	SAJWA73B74TG25856
G26134	SAJWA73B74TG26134
G26151	SAJWA73B74TG26151
G26196	SAJWA73B74TG26196
G26389	SAJWA73B74TG26389
G26439	SAJWA73B74TG26439
G26604	SAJWA73B74TG26604
G26778	SAJWA73B74TG26778
G27560	SAJWA73B74TG27560
G25879	SAJWA73B84TG25879
G26448	SAJWA73B84TG26448
G26465	SAJWA73B84TG26465
G27082	SAJWA73B84TG27082
G27194	SAJWA73B84TG27194
G27230	SAJWA73B84TG27230
G27258	SAJWA73B84TG27258
G27342	SAJWA73B84TG27342
G27602	SAJWA73B84TG27602
G27650	SAJWA73B84TG27650
G25941	SAJWA73B94TG25941
G26703	SAJWA73B94TG26703
G26751	SAJWA73B94TG26751
G26782	SAJWA73B94TG26782
G26846	SAJWA73B94TG26846
G27012	SAJWA73B94TG27012
G27124	SAJWA73B94TG27124
G27284	SAJWA73B94TG27284
G27432	SAJWA73B94TG27432
G27480	SAJWA73B94TG27480
G27608	SAJWA73B94TG27608
G27804	SAJWA73B94TG27804
G27902	SAJWA73B94TG27902
G25737	SAJWA73BX4TG25737
G25947	SAJWA73BX4TG25947
G25964	SAJWA73BX4TG25964
G26015	SAJWA73BX4TG26015
G26032	SAJWA73BX4TG26032
G26077	SAJWA73BX4TG26077
G26094	SAJWA73BX4TG26094
G26287	SAJWA73BX4TG26287
G26788	SAJWA73BX4TG26788
G27018	SAJWA73BX4TG27018
G27262	SAJWA73BX4TG27262
G27357	SAJWA73BX4TG27357
G27388	SAJWA73BX4TG27388
G27410	SAJWA73BX4TG27410
G25694	SAJWA74C04SG25694
G25744	SAJWA74C04SG25744
G25937	SAJWA74C04SG25937
G25940	SAJWA74C04SG25940
G25999	SAJWA74C04SG25999
G26005	SAJWA74C04SG26005
G26053	SAJWA74C04SG26053
G26084	SAJWA74C04SG26084
G26201	SAJWA74C04SG26201
G26246	SAJWA74C04SG26246
G26277	SAJWA74C04SG26277
G26280	SAJWA74C04SG26280
G26506	SAJWA74C04SG26506
G26537	SAJWA74C04SG26537
G26599	SAJWA74C04SG26599
G26845	SAJWA74C04SG26845
G26859	SAJWA74C04SG26859
G26943	SAJWA74C04SG26943
G27011	SAJWA74C04SG27011
G27557	SAJWA74C04SG27557
G27641	SAJWA74C04SG27641
G27901	SAJWA74C04SG27901
G25719	SAJWA74C14SG25719
G25722	SAJWA74C14SG25722
G25753	SAJWA74C14SG25753
G25784	SAJWA74C14SG25784
G25946	SAJWA74C14SG25946
G26059	SAJWA74C14SG26059
G26062	SAJWA74C14SG26062
G26093	SAJWA74C14SG26093
G26143	SAJWA74C14SG26143
G26160	SAJWA74C14SG26160
G26207	SAJWA74C14SG26207
G26224	SAJWA74C14SG26224
G26255	SAJWA74C14SG26255
G26286	SAJWA74C14SG26286
G26305	SAJWA74C14SG26305
G26322	SAJWA74C14SG26322
G26353	SAJWA74C14SG26353
G26384	SAJWA74C14SG26384
G26532	SAJWA74C14SG26532
G26563	SAJWA74C14SG26563
G26613	SAJWA74C14SG26613
G26675	SAJWA74C14SG26675
G26823	SAJWA74C14SG26823

Chassis No.	Full VIN	Chassis No.	Full VIN
G26871	SAJWA74C14SG26871	G25830	SAJWA74C44SG25830
G26997	SAJWA74C14SG26997	G25889	SAJWA74C44SG25889
G27051	SAJWA74C14SG27051	G25956	SAJWA74C44SG25956
G27115	SAJWA74C14SG27115	G25973	SAJWA74C44SG25973
G27213	SAJWA74C14SG27213	G25987	SAJWA74C44SG25987
G27311	SAJWA74C14SG27311	G26038	SAJWA74C44SG26038
G27339	SAJWA74C14SG27339	G26041	SAJWA74C44SG26041
G25728	SAJWA74C24SG25728	G26198	SAJWA74C44SG26198
G25731	SAJWA74C24SG25731	G26234	SAJWA74C44SG26234
G25809	SAJWA74C24SG25809	G26248	SAJWA74C44SG26248
G25812	SAJWA74C24SG25812	G26251	SAJWA74C44SG26251
G25843	SAJWA74C24SG25843	G26265	SAJWA74C44SG26265
G25969	SAJWA74C24SG25969	G26444	SAJWA74C44SG26444
G26068	SAJWA74C24SG26068	G26458	SAJWA74C44SG26458
G26071	SAJWA74C24SG26071	G26492	SAJWA74C44SG26492
G26166	SAJWA74C24SG26166	G26637	SAJWA74C44SG26637
G26362	SAJWA74C24SG26362	G26797	SAJWA74C44SG26797
G26426	SAJWA74C24SG26426	G27111	SAJWA74C44SG27111
G26474	SAJWA74C24SG26474	G27335	SAJWA74C44SG27335
G26488	SAJWA74C24SG26488	G27545	SAJWA74C44SG27545
G26510	SAJWA74C24SG26510	G25691	SAJWA74C54SG25691
G26619	SAJWA74C24SG26619	G25707	SAJWA74C54SG25707
G26653	SAJWA74C24SG26653	G25710	SAJWA74C54SG25710
G26734	SAJWA74C24SG26734	G25738	SAJWA74C54SG25738
G26863	SAJWA74C24SG26863	G25741	SAJWA74C54SG25741
G26913	SAJWA74C24SG26913	G25934	SAJWA74C54SG25934
G26961	SAJWA74C24SG26961	G25965	SAJWA74C54SG25965
G26989	SAJWA74C24SG26989	G25996	SAJWA74C54SG25996
G27253	SAJWA74C24SG27253	G26002	SAJWA74C54SG26002
G27575	SAJWA74C24SG27575	G26047	SAJWA74C54SG26047
G27916	SAJWA74C24SG27916	G26050	SAJWA74C54SG26050
G25818	SAJWA74C34SG25818	G26078	SAJWA74C54SG26078
G25821	SAJWA74C34SG25821	G26081	SAJWA74C54SG26081
G25849	SAJWA74C34SG25849	G26274	SAJWA74C54SG26274
G25852	SAJWA74C34SG25852	G26484	SAJWA74C54SG26484
G25883	SAJWA74C34SG25883	G26498	SAJWA74C54SG26498
G26175	SAJWA74C34SG26175	G26520	SAJWA74C54SG26520
G26368	SAJWA74C34SG26368	G26663	SAJWA74C54SG26663
G26371	SAJWA74C34SG26371	G26744	SAJWA74C54SG26744
G26399	SAJWA74C34SG26399	G26789	SAJWA74C54SG26789
G26452	SAJWA74C34SG26452	G27277	SAJWA74C54SG27277
G26502	SAJWA74C34SG26502	G27571	SAJWA74C54SG27571
G26516	SAJWA74C34SG26516	G27649	SAJWA74C54SG27649
G26595	SAJWA74C34SG26595	G25697	SAJWA74C64SG25697
G26631	SAJWA74C34SG26631	G25716	SAJWA74C64SG25716
G26855	SAJWA74C34SG26855	G25747	SAJWA74C64SG25747
G26919	SAJWA74C34SG26919	G25750	SAJWA74C64SG25750
G27147	SAJWA74C34SG27147	G25943	SAJWA74C64SG25943
G27181	SAJWA74C34SG27181	G26008	SAJWA74C64SG26008
G27469	SAJWA74C34SG27469	G26056	SAJWA74C64SG26056
G27617	SAJWA74C34SG27617	G26087	SAJWA74C64SG26087
G27925	SAJWA74C34SG27925	G26090	SAJWA74C64SG26090
G27956	SAJWA74C34SG27956	G26204	SAJWA74C64SG26204
G25701	SAJWA74C44SG25701	G26249	SAJWA74C64SG26249

Chassis No.	Full VIN
G26302	SAJWA74C64SG26302
G26316	SAJWA74C64SG26316
G26381	SAJWA74C64SG26381
G26591	SAJWA74C64SG26591
G26669	SAJWA74C64SG26669
G26722	SAJWA74C64SG26722
G26879	SAJWA74C64SG26879
G26977	SAJWA74C64SG26977
G27143	SAJWA74C64SG27143
G27725	SAJWA74C64SG27725
G25725	SAJWA74C74SG25725
G25806	SAJWA74C74SG25806
G25837	SAJWA74C74SG25837
G25840	SAJWA74C74SG25840
G25949	SAJWA74C74SG25949
G25952	SAJWA74C74SG25952
G26065	SAJWA74C74SG26065
G26096	SAJWA74C74SG26096
G26258	SAJWA74C74SG26258
G26289	SAJWA74C74SG26289
G26292	SAJWA74C74SG26292
G26308	SAJWA74C74SG26308
G26311	SAJWA74C74SG26311
G26356	SAJWA74C74SG26356
G26387	SAJWA74C74SG26387
G26390	SAJWA74C74SG26390
G26647	SAJWA74C74SG26647
G26728	SAJWA74C74SG26728
G26907	SAJWA74C74SG26907
G26969	SAJWA74C74SG26969
G27233	SAJWA74C74SG27233
G27457	SAJWA74C74SG27457
G25815	SAJWA74C84SG25815
G25846	SAJWA74C84SG25846
G25877	SAJWA74C84SG25877
G25880	SAJWA74C84SG25880
G25927	SAJWA74C84SG25927
G26169	SAJWA74C84SG26169
G26172	SAJWA74C84SG26172
G26334	SAJWA74C84SG26334
G26396	SAJWA74C84SG26396
G26432	SAJWA74C84SG26432
G26480	SAJWA74C84SG26480
G26625	SAJWA74C84SG26625
G26687	SAJWA74C84SG26687
G26740	SAJWA74C84SG26740
G26785	SAJWA74C84SG26785
G26849	SAJWA74C84SG26849
G26852	SAJWA74C84SG26852
G26933	SAJWA74C84SG26933
G26947	SAJWA74C84SG26947
G26981	SAJWA74C84SG26981
G27001	SAJWA74C84SG27001
G27175	SAJWA74C84SG27175
G27189	SAJWA74C84SG27189
G27645	SAJWA74C84SG27645
G27919	SAJWA74C84SG27919
G25824	SAJWA74C94SG25824
G25855	SAJWA74C94SG25855
G25886	SAJWA74C94SG25886
G26178	SAJWA74C94SG26178
G26181	SAJWA74C94SG26181
G26195	SAJWA74C94SG26195
G26214	SAJWA74C94SG26214
G26231	SAJWA74C94SG26231
G26262	SAJWA74C94SG26262
G26603	SAJWA74C94SG26603
G26813	SAJWA74C94SG26813
G26875	SAJWA74C94SG26875
G26925	SAJWA74C94SG26925
G26939	SAJWA74C94SG26939
G26973	SAJWA74C94SG26973
G27041	SAJWA74C94SG27041
G27265	SAJWA74C94SG27265
G27461	SAJWA74C94SG27461
G27511	SAJWA74C94SG27511
G27637	SAJWA74C94SG27637
G27881	SAJWA74C94SG27881
G25704	SAJWA74CX4SG25704
G25735	SAJWA74CX4SG25735
G25833	SAJWA74CX4SG25833
G25959	SAJWA74CX4SG25959
G25962	SAJWA74CX4SG25962
G25993	SAJWA74CX4SG25993
G26044	SAJWA74CX4SG26044
G26075	SAJWA74CX4SG26075
G26139	SAJWA74CX4SG26139
G26156	SAJWA74CX4SG26156
G26187	SAJWA74CX4SG26187
G26190	SAJWA74CX4SG26190
G26268	SAJWA74CX4SG26268
G26271	SAJWA74CX4SG26271
G26299	SAJWA74CX4SG26299
G26402	SAJWA74CX4SG26402
G26416	SAJWA74CX4SG26416
G26609	SAJWA74CX4SG26609
G26903	SAJWA74CX4SG26903
G26965	SAJWA74CX4SG26965
G27047	SAJWA74CX4SG27047
G27940	SAJWA74CX4SG27940

CANADA

Chassis No.	Full VIN
G25994	SAJXA71C04SG25994
G26031	SAJXA71C04SG26031
G25854	SAJXA71C64SG25854
G26835	SAJXA71C74SG26835
G27928	SAJXA71C84SG27928
G26814	SAJXA73B14TG26814
G26974	SAJXA73B14TG26974
G26417	SAJXA73B24TG26417
G26630	SAJXA73B24TG26630
G26497	SAJXA73B44TG26497
G26662	SAJXA73B44TG26662
G26423	SAJXA73B84TG26423
G26874	SAJXA73B84TG26874
G26620	SAJXA73BX4TG26620
G26283	SAJXA74C04SG26283
G26817	SAJXA74C04SG26817
G27305	SAJXA74C04SG27305
G26132	SAJXA74C14SG26132
G26365	SAJXA74C24SG26365
G26679	SAJXA74C34SG26679
G27668	SAJXA74C34SG27668
G27735	SAJXA74C34SG27735
G26528	SAJXA74C44SG26528
G27347	SAJXA74C54SG27347
G26837	SAJXA74C64SG26837
G27065	SAJXA74C64SG27065
G27261	SAJXA74C64SG27261
G27325	SAJXA74C64SG27325
G26359	SAJXA74C74SG26359
G26393	SAJXA74C74SG26393
G26829	SAJXA74C74SG26829
G27441	SAJXA74C84SG27441
G27567	SAJXA74C84SG27567
G25990	SAJXA74C94SG25990
G26296	SAJXA74C94SG26296
G26704	SAJXA74C94SG26704
G27061	SAJXA74C94SG27061
G27805	SAJXA74C94SG27805

MEXICO

Chassis No.	Full VIN
G27506	SAJYA73R44TG27506
G26887	SAJYA74P04SG26887
G26867	SAJYA74P54SG26867
G26801	SAJYA74P84SG26801

RE: R-719 Recall – Instrument Pack Trim Edge

Vehicles Affected: 2004 MY XJ

Dear Jaguar Owner:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act.

Jaguar Cars have determined that a defect relating to motor vehicle safety exists on 2004 MY XJ models. If you are a recipient of this notice this letter is to inform you that your vehicle is included in this recall.

Following is a range of the affected vehicles by Vehicle Identification Number (VIN).

- 2004 Jaguar XJ G25690-G27957

What is the problem?

During the manufacturing process, the aperture in the instrument panel through which the passenger air bag deploys may not have been correctly finished leaving sharp edges. In the event the passenger air bag was to deploy, the air bag may be ruptured by the sharp edge. If the airbag ruptured, the seat occupant may not be properly protected in the event of a crash and incur serious injury.

What will Jaguar and your Dealer do?

Jaguar Cars will inspect the passenger air bag instrument panel aperture edge finish and where necessary, remove any sharp serrated edges.

How long will it take?

The repair will take approximately quarter of an hour, although your dealer may need your vehicle for a longer time due to service scheduling requirements

What should you do?

At your earliest convenience you should contact your authorized Jaguar Dealer who will be able to make an appointment to undertake the necessary actions. To assist your Dealer please ensure that at the time of contact you have at available your applicable Vehicle Identification Number.

Moved or no longer own a Jaguar?

Please fill out the enclosed card and return it to Jaguar by simply putting it in the mail.

Should you have the need to contact Jaguar by mail, please use the following address:

Jaguar Cars
ATTN: Customer Relationship Center
555 MacArthur Boulevard
Mahwah, NJ 07430-2327

What you should do if you have already paid to have this work completed?

If you meet all the following requirements, you are eligible to receive reimbursement

1. You own or have owned a 2004 MY Jaguar XJ within the VIN range listed above.
2. You have paid for the repair to the defect outlined previously in this letter.
3. The repair was performed before April 2004
4. You have an original or legible copy of the paid repair order or invoice showing:
   - A description of the concern reported
   - Itemized parts and labor charges
   - The vehicle model and year and the vehicle identification number
   - The repair date
   - Repair mileage
   - Name and address of the authorized Jaguar Dealer or licensed repair shop
   - Your name and address at the time of the repair

If you have all of the above information, present it to the Dealers Service Manager and they will arrange reimbursement of your claim.

Please ensure that you retain copies of all of the paperwork supporting this claim.

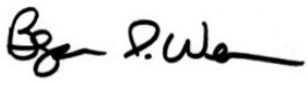
If an authorized Jaguar dealer fails or is unable to satisfactorily answer your concerns about this notice, without charge within 60 days, pursuant to law 49 U.S.C. Chapter 301, you may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 or call the toll-free Auto Safety Hotline at 888-327-4236.

Attention Leasing Agencies.

Federal regulation requires that you forward this recall notice to the lessee within 10 days.

What you should do if you have further questions?
Please contact your Jaguar Dealer or the Jaguar Customer Relationship Center at 1 800 4JAGUAR (1 800-452-4827), option 9 or by e-mail at jaguarowner@jaguar.com.

Sincerely,



Benjamin I. Weiner
Customer Satisfaction Manager

JAGUAR SERVICE

Issue Date 01/2003

VEHICLE MAINTENANCE CHECKLIST

All 2004 Models

S18/04

VEHICLE INFORMATION

VEHICLE OWNER | R.O. # | DATE

VIN | MODEL CODE | ODOMETER

MAINTENANCE CHECKLIST

Maintenance Intervals every 10,000 mi. (16,000 km) or 12 months, whichever occurs first.

NOTE: Protect the interior and fenders of the vehicle before proceeding.

	MAINTENANCE INTERVAL (CHECK ONE):									
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
miles x 1,000:	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
kilometers x 1,000:	**16**	**32**	**48**	**64**	**80**	**96**	**112**	**128**	**144**	**160**
ENGINE COMPARTMENT										
Check / top up brake fluid level *	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Check / top up coolant level; assure specific gravity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Check / top up power assisted steering fluid level	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Check / top up windshield washer fluid level	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Check drive belt tension wear indicator(s); replace belt(s) if necessary or as specified	☐	☐	☐	☐	☐	☐	☐	☐	☐	
Check / top up battery electrolyte level (X-TYPE models only)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Check / adjust headlamp alignment (XJ models only)		☐		☐		☐		☐		☐
Visually check for fluid leaks	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Replace air filter element				☐				☐		
Replace fuel filter (all models except X-TYPE)						☐				
Replace fuel filter (X-TYPE models only)							☐			
Replace pollen filter (XJ and X-TYPE models)		☐		☐		☐		☐		☐
Replace pollen filter (XK and S-TYPE models)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Replace engine coolant	– every 5 years or 150,000 miles (240,000 kilometers) –									
Replace spark plugs										☐
Replace accessory drive belt (XJ, XK and S-TYPE models)	– every 150,000 miles (240,000 kilometers) –									
Replace rear drive belt (X-TYPE models only)							☐			
Replace Supercharger drive belt										☐
TRUNK										
Check / top up battery electrolyte level (XJ, XK and S-TYPE models)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Check spare tire pressure, tread depth and general condition; record tread depth below **	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
UNDERBODY										
Replace engine oil, filter and drain plug washer	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Inspect brake pads for wear; check rotor condition on pad change	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Visually check for fluid leaks	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
EXTERIOR										
Replace windshield wiper blade rubber insert(s) (all models except X-TYPE)	☐	☐	☐		☐	☐	☐		☐	☐
Replace windshield wiper blade(s) and insert(s) (all models except X-TYPE)				☐				☐		
Check tire pressures, tread depth and general condition; record tread depth below **	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Perform comprehensive road test; verify parking brake operation; record comments below	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

OTHER PROCEDURES

* REPLACE BRAKE FLUID EVERY 2 YEARS: ☐ 2-YR. MAINTENANCE ☐ 4-YR. MAINTENANCE ☐ 6-YR. MAINTENANCE

** RECORD TIRE TREAD DEPTH: LH FRONT | RH FRONT | LH REAR | RH REAR | SPARE

COMMENTS

TECHNICIAN NAME | SIGNATURE